ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION

1,500,000-gal. Horton radial-cone bottom water tank—70 ft. to bottom—built for the Springfield City Water Company, Springfield, Missouri.

The Springfield City Water Company, Springfield, Missouri, erected a 750,000-gal. Horton standpipe in 1903. Today, almost fifty years later, this tank is still in operation . . . still providing dependable water storage facilities. However, additional facilities were provided in 1927 by a 750,000-gal. Horton ellipsoidal-bottom elevated tank . . . and in 1951 by a 1,500,000-gal. Horton radial-cone bottom elevated tank.

These three tanks have been located in Springfield to form a distributed storage pattern that helps provide better water service *throughout* the city.

Horton elevated water tanks are built in standard capacities from 5,000 to 3,000,000 gallons. Horton standpipes are built in standard capacities up to 10,000,000 gallons. Write our nearest office for complete information.

Left: Diagrammatic map of Springfield, Missouri, showing location of three Horton water tanks.

CHICAGO BRIDGE & IRON COMPANY

	1506 Lafayette Building	Philadelphia, 3	1623—1700 Walnut St., Building
	402 Abreu Building	San Francisco, 4	1530—200 Bush Street
	2109 C & I Life Building	Seattle, 1	1312 Henry Building
	General Petroleum Building	Tulsa, 3	1617 Hunt Building
	311—165 Broadway Building	Washington 6, D. C.	1152 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT

TWO LPC TS 300 MOTOR SCRAPERS WORKED 4000 HOURS EACH . . .

with only 50¢ per hour per machine for ALL repairs!

Some of the Other Motor Scraper Features That Cut Earthmoving Costs

- Big capacity . . . 14-yds. struck and 18-yds. heaped . . . to haul bigger pay loads each trip.
- Over 22 mph for speed on the haul road, to make more trips per hour.
- Your choice of power . . . a 280 HP Buda or a 275 HP Cummins diesel for fast acceleration and extra power when you need it.
- Big interchangeable tires for extra traction and flotation.
- Easy loading characteristics that cut valuable seconds off your cycle time.
- Extra high apron lift and positive forced ejection for faster, smoother spreading.

That's really low-cost earthmoving for CONCRETE MATERIALS & CONSTRUCTION CO.

FROM March 1 to December 24, 1951, Concrete Materials & Construction Co. operated their LaPlant-Choate TS 300s two 10-hour shifts, six days a week, stripping 120-ft. of overburden on a job near Cedar Rapids. In 4000 machine hours, total repairs for each rig amounted to only 50¢ per hour, *and that included tires!*

To get ready for the new season, engines were completely overhauled and the only repairs found necessary were new rings and bearings. After 4000 hours, the cylinders showed only .002 of an inch wear!

It's no wonder Concrete Materials is sold on Motor Scraper performance. On top of such low maintenance, their TS 300s give them the kind of power that easily handled materials varying from sandy loam to heavy blue clay in a pit loaded with springs, making the going plenty muddy.

TWO YEARS' WORK IN ONE!

BY working their TS 300 Motor Scrapers two ten-hour shifts a day, with such little time out for maintenance or repair, Concrete Materials & Construction Co. completed two years' work in one. This was a job where the Motor Scraper's ability to keep punching, with little time out for tinkering, really paid off. Minimum maintenance is just another reason why it will pay you to follow the lead of so many big-time contractors who cut earthmoving costs with LaPlant-Choate Motor Scrapers. See your LaPlant-Choate distributor today for complete details about *all* Motor Scraper advantages.

LAPLANT-CHOATE

MANUFACTURING CO., INC. — CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

LEUPOLD LEVELS

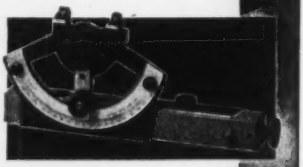
for CONVENIENCE and ACCURACY...

Performance tells...and since 1907 precision-engineered LEUPOLD instruments have been used, the world over. When you use LEUPOLD Levels you are assured of the greatest accuracy modern research and manufacturing can produce — plus time-saving convenience and versatility which no similar products can give.

LEUPOLD HAND LEVEL

Accuracy and convenience in a small package! This practical, easy-to-use Level measure. 5¼ inches overall length with ¾ inch outside diameter. Exclusive LEUPOLD bubble magnifier adjusts internally to the user's eye, eliminating constant refocusing. Sealed against dust and moisture. Furnished in handsome saddle leather case.

$11.70



LEUPOLD ABNEY LEVEL

Exclusive patented design permits changing scales without removing and reversing the frame. Thumb screws hold all scales in milled slide, and any scale can be quickly superimposed on others for immediate use.

Bubble magnifier adjusts internally to the user's eye, eliminating the need to refocus every time the Level is removed from its case. Thumb nut index arm adjustment provides micrometer accuracy. Radius of arc, 1¾ inches. Overall length, 6½ inches. Furnished in heavy leather case with belt loop. *Four scales available: per cent, topographic, degrees or chainage correction.*

MODEL A (Choice of any 2 scales) **$27.50**
MODEL B (Choice of any 3 scales) **$30.00**

MAIL THIS COUPON TODAY

Enclosed is ☐ check or ☐ money order for $_____
Please send the LEUPOLD Level checked below.
_____The HAND LEVEL @ $11.70.
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Send literature on ☐ LEVELS ☐ COMPASSES.
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LEUPOLD & STEVENS INSTRUMENTS, Inc.
PORTLAND 13, OREGON

ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 148 JUNE 26, 1952 No. 26

WALDO G. BOWMAN
Editor

FEATURES IN THIS ISSUE

How to know what's going on 36
Composting for profit 44
Man-made hurricane tests windows 49
Navy patches Key West aqueduct 50
Shaped charges speed blast hole drilling for Army 50

DEPARTMENTS

Reader Comment	9	Labor	60
Construction Trends	17	Men and Jobs	62
Construction Week	19	Obituaries	65
News of the Week	21	Business and Finance	81
Meetings	26	Unit Prices	84
Municipal	30	Construction Reports	85
International	55	New Products	102

Editorials 108

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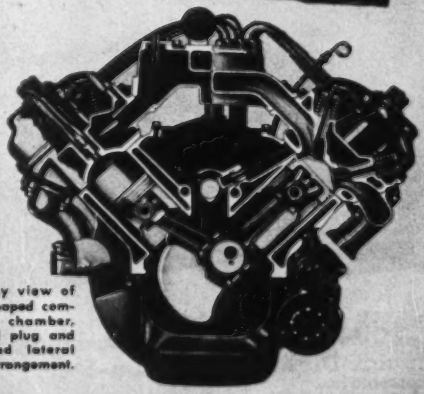
CHRYSLER INDUSTRIAL

offers Greater Power, More Efficiency!



Cutaway view of dome-shaped combustion chamber, centered plug and overhead lateral valve arrangement.

Here's why . . . The great new Chrysler V-8 Industrial Engine is completely new in V-8 design. This engine embodies more desirable characteristics than ever before offered to Industrial engine users.

Hemispherical Combustion Chamber provides 33 per cent more horsepower, 16 per cent higher torque. It increases displacement only 3.2 per cent,* yet develops more power for displacement than any comparable engine in Industrial use. *It is today's most nearly perfect combustion chamber!* It allowed many desirable changes in V-8 design—most important of which are larger and wider spaced valves and "free-flow" intake and exhaust porting.

Centered Spark Plugs provide shorter flame travel through fuel. You get greater power from the same amount of fuel; easier, faster starting, *plus* less carbon deposit in the chamber, adding years to engine life.

Overhead Lateral Valves are larger, wider spaced. They operate cooler, eliminating pre-ignition. This ingenious valve arrangement permits gravity flow of the fuel and air mixture into intake and out of exhaust ports—practically eliminates back pressure.

More Efficient Cooling is due to less heat rejection in the combustion chamber. More heat is turned to power. More coolant flows around valves and bore. Water jacket completely surrounds cylinder. With *less coolant* this new engine *has better cooling* —a more compact, efficient, over-all cooling system!

These are only a few of the important developments made in Chrysler Industrial V-8's. There are many more. *These* engines will give you a whole new conception of Industrial power. Ask a Chrysler Industrial Engine Dealer to explain their advantages on your jobs, or write us direct for full information. **Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Ave., Detroit 31, Michigan.**

*Model IND-20

CHRYSLER

Industrial V-8 Engines

Another contractor gets more done with his

Heiliners!

200-hp Cummins Diesel!

High top speed (25 mph), plenty of lugging power. Compression release for quick, easy starts.

Easy-handling Hydro-Steer!

Makes steering effortless. You can turn the Heiliner with one hand in a 22-foot radius.

Sure-footed Drive Wheels!

Maximum traction. Drive wheels carry 70% of the total vehicle weight. 24:00 x 29 tires.

Adjustable Control Levers!

Heiliner cable power-control unit is within finger-tip reach. Levers adjustable to suit operator.

"... wet material ... wet, unstable bottoms ... three Heiliners doing top job!"

That's what W. R. Tobin reports from a New York highway job. He's superintendent of The Tomlinson Construction Co., Ltd., Toronto, Canada

Want a good idea of how Heiliner performance pays off when the going's rough? Let W. R. Tobin tell you how three Heiliners are meeting the acid test on a section of New York Thruway near Weedsport, N. Y.:

"Conditions here have been by far the worst we have been up against, as far as wet material to handle and wet, unstable bottoms are concerned.

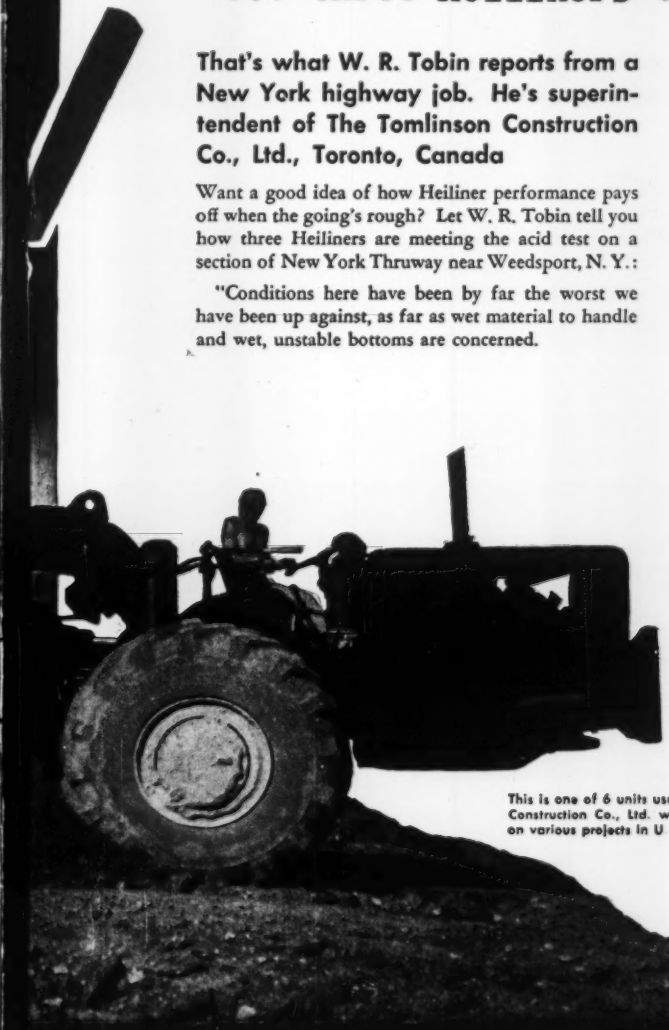
"These conditions give any kind of equipment a lot of trouble, but we have found that the Heiliners handle them better than any other type we have used."

To contractors everywhere, using Heiliners means making a good showing — in all kinds of weather, over all kinds of ground and fill conditions. The extra traction of Heiliners, their extra speed and bonus loads make money for you every time.

Get a close-up look at a Heiliner in action. See how Heiliners move more dirt faster, at less cost. Ask your Heil road-machinery distributor to arrange a demonstration, or write us. 8-128

THE HEIL CO.

DEPT. 162, 3001 W. MONTANA ST., MILWAUKEE 1, WIS.
Factories: Milwaukee — Hillside, N. J.



This is one of 6 units used by Tomlinson Construction Co., Ltd. with such success on various projects in U. S. and Canada.

Free Bulletin RM-5000B shows why you can bank on a Heiliner to help you meet schedules and avoid penalties. Write for your copy

4-Wheel Brakes!

Heavy-duty two-shoe air brakes. Auxiliary hand controls provided also.

Good Visibility!

No obstructions block operator's vision ahead or behind. He can always see how he's doing.

Comfortable Seat!

Reduces operator fatigue, by absorbing the shocks in rough going.

Easy-to-Service Gears!

Final planetary drive reduction gears can be serviced without removing wheels or disturbing brakes or hub bearings.

in sound conditioning

. . . count on this expert to do the job right every time!

Sound Conditioning is one contract you can let and forget . . . *if* you put the responsibility in the dependable hands of your local distributor of Acousti-Celotex products. Don't take our word for it, ask any general contractor who has!

The very minute the contract is signed, you are free from work and worry. No fumbling. No tinkering with your specifications. No risk of a botched-up job. You're sure *in advance* of the most effective, most attractive Sound Conditioning installation possible!

You can depend on your distributor of Acousti-Celotex products. He's a member of the world's most experienced Sound Conditioning organization, with more installations to its credit than any other. He has the trained, experienced men—the job-proved techniques—the complete line of superior, specialized acoustical products to meet every specification, every requirement, every building code.

GET A FREE ANALYSIS of the noise problem in any buildings you are planning without obligation. Write now for the name of your local distributor of Acousti-Celotex products. You will also receive free the informative booklet, "25 Answers to Questions on Sound Conditioning." The Celotex Corporation, Dept. Z-62, 120 S. LaSalle Street, Chicago 3, Ill. In Canada, Dominion Sound Equipments, Ltd., Montreal, Quebec.

CAN BE WASHED REPEATEDLY—Two coats of tough finish, bonded under pressure of a hot knurling iron, build a surface of superior washability right into Acousti-Celotex Tile.

ACOUSTI-CELOTEX

TRADE MARK REGISTERED U. S. PAT. OFF.

Sound Conditioning

PRODUCTS FOR EVERY SOUND CONDITIONING PROBLEM

THE CELOTEX CORPORATION, 120 S. LA SALLE ST., CHICAGO 3, ILLINOIS

PART I ESTIMATING PRODUCTION

JOB ANALYSIS

A basic knowledge of the job, and of the haulage equipment being considered for the job, is necessary to prepare a hauling production and cost estimate. Careful preparation and thorough analysis are required, and an accurate estimate of production must take into consideration the material being moved and the various components of a complete hauling cycle. These are as follows:

HAULING CYCLE COMPONENTS

	CONTRIBUTING FACTORS
LOAD	Size and type of loading machine. Type and condition of material to be loaded. Capacity of hauling unit. Skill of the operator.
HAUL	Performance ability of hauling unit. Hauling distance. Haul road condition. Grades. Miscellaneous conditions affecting haul speed.
DUMP	Destination of material. Type and maneuverability of hauling unit. Type and condition of material.
RETURN	Performance ability of hauling unit. Return distance. Haul road condition. Grades. Miscellaneous conditions affecting return speed.
SPOT	Maneuverability of hauling unit. Type of loading machine. Location of loading equipment.

2

This enlarged and revised Euclid manual shows how to make a job analysis and provides a method of estimating production and costs for off-the-highway hauling equipment. It will enable you to determine the number and size of hauling units required for any job, and the estimated cost of moving material per cubic yard or ton.

You'll find the data contained in this book helpful and easy to use. If you haven't received a copy, contact your Euclid Distributor, or write us direct . . . on your letterhead, please. There is no charge or obligation, of course.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID CODE: BENTLEY

HERE'S WHAT ONE LEADING CONTRACTOR HAS TO SAY ABOUT FLEX-PLANE'S SUPER PORTABLE FINISHER . . .

DENTON CONSTRUCTION COMPANY
GENERAL MOTORS BUILDING
DETROIT 2, MICHIGAN

March 6,1952.

Mr. Donald T. Heltzel
General Manager
Flexible Road Joint Machine Company
Warren, Ohio.

Dear Sir:

We have been using two of your "Detroit Special" finishing machines on numerous projects in and around the City of Detroit for the past two years. Our overall experience with these machines has been very satisfactory. Following are some of the advantages we have found.

(a) Most important is the increased production due to higher rate of travel and screed action.

(b) The hydraulically operated moving mechanism reduced our job to job moving time to an absolute minimum.

(c) Changing width of machine and screeds for various pavement designs is accomplished readily due to built-in features which facilitate same.

(d) Balance and flexibility has proved to be excellent. On one test track job, a 200 ft. radius curve with 42 inch super-elevation in 12 feet was negotiated without difficulty and handling "no slump" concrete at the same time. In this case we attribute such performance in part, to the very fine turning clutches.

(e) Strength has not been sacrificed although total weight has been reduced sufficiently to permit operation on 13 inch light-construction forms and integral curb work.

(f) Power-plant, clutches, gear boxes and hydraulic controls perform perfectly and reflect superior design and construction.

(g) Last but not least is the low maintenance experience we have enjoyed, plus a definite attitude on the part of the manufacturer to "serve-after-sale".

Obviously the sum total of these factors mean dollars and cents in any owners' pocket.

Sincerely yours,
DENTON CONSTRUCTION COMPANY
By C. C. Leduman
C. C. Leduman - Gen'l Supt.

CCL:PT
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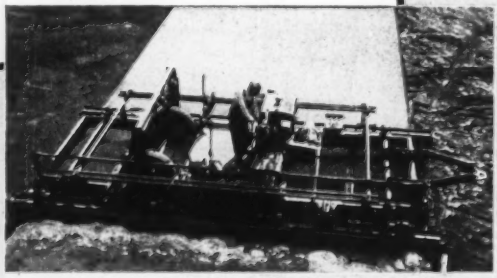


The Detroit Special Portable Finishing Machine is the most mobile, sturdiest, easiest-to-use — most profitable finisher on the forms today. In many cases the Special has completely paid for itself on the first job. Get all the information. We'll be happy to furnish you with bulletins or movies, arrange interviews with owners, give you full technical assistance and engineering help.

Just write to **Detroit Special, Flexible Road Joint Machine Co., Warren, Ohio.**

Flex-Plane

The Flexible Road Joint Machine Co.

WARREN, OHIO

Construction Equipment Since 1910

Heltzel

READER COMMENT

Allston Dana

Sir: I can't resist the temptation to write a few words (it should be many), concerning my close friend and business associate, Allston Dana, who died on May 12th, of a sudden and unexpected heart attack.

I did not know Allston until he became associated with us nearly eight years ago. His great reputation as a designer of famous bridges, of course, we all knew, but as the grand person that he was, we knew him not at all as we grew to know him later. Until his brother died in Cambridge two years ago and I read his obituary notice, I didn't know that Allston's two grandfathers (Richard Henry Dana and Henry Wadsworth Longfellow) wrote the poems and books that we as children were brought up with.

He graduated from Harvard and then from Massachusetts Institute of Technology, and was associated with the design of several of the great suspension bridges in New York and Philadelphia, but it took me years to know what that tall, lean man was like inside, to know that he had a most delightful wife, three grown children and eleven grandchildren.

Not until after he joined us did we know of the evenings he spent in studying the stars and in designing and building with his own hands a replica of his idea of the universe and the spacing of the stars in it.

He seldom read the daily papers and never listened to the radio, and perhaps never saw a television, but seemed to know what was going on in the world and why and by whom. He was far more interested in his universe that he was constructing than in the world our betters are trying to build.

But in front of the fire at my house or his, with a tall glass in his hand, he would hold us all and call forth from young and old a most active discussion of world affairs, world personages, domestic affairs, and family affairs, with never a word of bridge design and his pet hobbies, his universe or mathematical problems. His staff says that no mathematical problem failed to interest him and he would tackle them with a smile and never give up until it was solved. They loved and respected him and several of them told me he was not only a teacher but a father to them.

Toward the end of the war he returned to his house in Connecticut,

(Continued on page 12)

President Aleman Dam brings new life to Mexico's Butterfly Basin

FOR centuries, the gentle name of the Papaloapan (Butterfly) River Basin in lower Mexico has been bitterly ironic. Its frequent floods spread disease and destruction from mountains to Gulf. Because the soil was rich, men have always lived there, though gambling with the water. But they have always lost. Of nearly a million people in the basin in 1947, only 2 in 10 owned shoes, only 3 in 10 could read and write. Average life in many localities was only 29 yrs.

Now, that dismal basin has become a Promised Land. Under direction of the Comision del Papaloapan, old towns have new life. Land has been reclaimed. Settlers and investors flow in. When completed in 1953, the President Aleman Dam, largest in Latin America and keystone of the vast $300,000,000 reclamation program, alone will: (1) Prevent floods which cause almost $600,000 damage annually. (2) Straighten and deepen the river, doubling water capacity and improving navigation. (3) Generate 150,000 kw. for household and industrial power. (4) Store 8500-million cubic yards of water to irrigate about 300,000 acres of arid wasteland.

The dam will actually be two giant earth and rock walls. The first, called "La Cortina", will shut off the flow of the Tonto River at Temazcal, the second, known as "El Dique", will close a pass through the mountains, 1½ miles north of La Cortina.

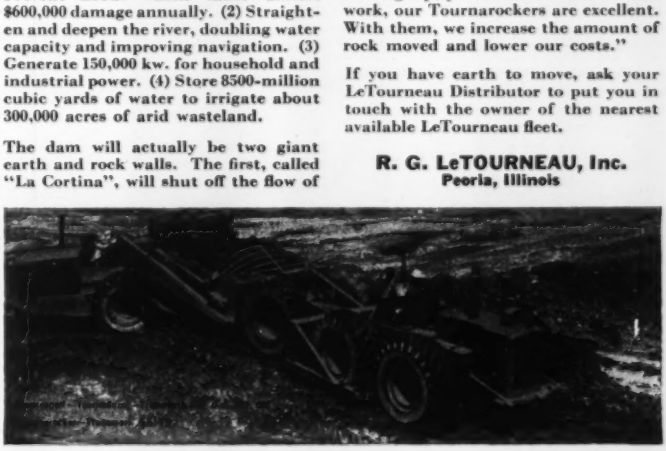
Constructora "El Aguila" assigns 6,700,000 yds. to 32 LeTourneau units

Earthmoving for both is being handled by Constructora "El Aguila", S. A. of Mexico, D. F. Their 32 LeTourneau rubber-tired machines which were driven to the job, are handling 57% of the total 12 million cubic yards to be moved. Some came 1130 mi. through highway traffic from Laredo, Texas, in 68 hours, total driving time.

In discussing the operation, Jose Bertran Cusine, president of the firm, said, "We are very much satisfied with the performance of our Tournapulls and Tournadozers. They're the best earthmoving equipment we own. For rock work, our Tournarockers are excellent. With them, we increase the amount of rock moved and lower our costs."

If you have earth to move, ask your LeTourneau Distributor to put you in touch with the owner of the nearest available LeTourneau fleet.

R. G. LeTOURNEAU, Inc.
Peoria, Illinois



This is the pipe

that's known as the

Taxpayers' Friend

To a tax-burdened public the statement that cast iron pipe is the "taxpayers' friend" is more than a mere figure of speech. To most waterworks engineers it is a cold fact. They know that cast iron pipe in water distribution systems has saved, and continues to save, millions of dollars in local taxes.

The useful life of cast iron pipe is known to be 4 to 5 times the average term of a water revenue bond issue. More than 35 American cities have cast iron mains in service that were installed over 100 years ago. A survey sponsored by three waterworks associations shows that 96% of all six-inch and larger cast iron pipe *ever laid* in 25 representative cities, is still in service.

Fortunately for taxpayers, over 95% of the pipe in America's water distribution systems is long-lived cast iron pipe—*the taxpayers' friend.*

This cast iron water main installed in Richmond, Virginia, 120 years ago, is still in service. Over 35 other cities have century-old cast iron mains in service.

CAST IRON ®

CAST IRON PIPE

America's No. 1 Tax Saver

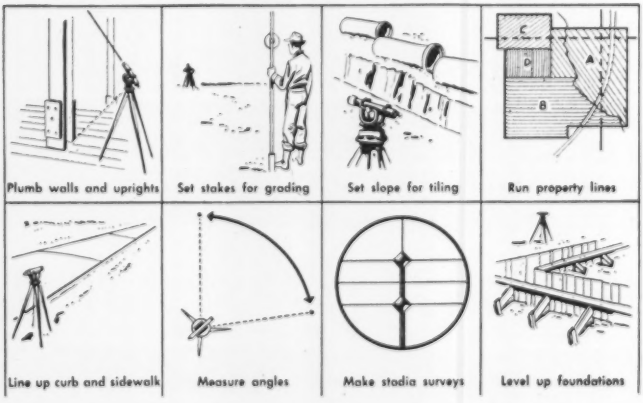
©1952, Cast Iron Pipe Research Association

CAST IRON PIPE RESEARCH ASSOCIATION, THOS. F. WOLFE, MANAGING DIRECTOR, 122 SO. MICHIGAN AVE., CHICAGO 3.

White Universal Level-Transit...

most versatile instrument you can own!

INDISPENSABLE FOR THESE JOBS — AND MANY MORE



ENGINEERS agree: you can do more jobs better — at lower cost — with the White "Universal" Level-Transit. The improved Model 3000 has internal focusing, coated optics, a guarded vertical arc. Plus all the other quality features needed to give you lifetime durability and accuracy. The price: *only* $185*, complete with tripod. See your dealer, or write DAVID WHITE COMPANY, 315 W. Court St., Milwaukee 12, Wis.

*Price subject to change without notice.

DAVID WHITE COMPANY

We offer the most expert **REPAIR SERVICE** *on all makes, all types of instruments.*

7274

(Continued from page 9)

apparently expecting to retire, but when I asked him to join us he confessed that he thought he should go to work again as the war was not over and he felt guilty loafing up there in the beautiful Connecticut countryside. He joined us then and there and kept busy until the day of his death. His staff says he seemed particularly well and happy and worked harder the last few weeks than he had for a long time.

FARLEY GANNETT
Harrisburg, Pa.

Contractor designs?

Sir: I have been reading with a great deal of interest the various views expressed in Engineering News-Record as to the desirability of permitting contractors to submit their own designs with their bid for any given facility.

I wish to register my very emphatic approval of generally permitting this, subject, of course, to the authority of the Owner and his representatives to reject any bid based on unsuitable design.

I do not believe it generally to be the fact that the designing architect or engineer has unlimited experience in the field in which he is working or that his judgment as to relative cost is final. The situation, experience and equipment of each contractor is different, so that permitting alternate designs should give the Owner the advantage of savings that he would not otherwise secure.

CHARLES MAYER
Consulting Engineer
New York City

Correction

Sir: The article "Los Angeles Freeway Cost $150 Million" in the April 17 ENR stated that all bridge design was done in the headquarters office at Sacramento.

This is not accurate. Eight of these bridges, viz., those that carry Los Angeles St., Main St., North Spring St., and North Broadway over the freeway adjoining the Civic Center (which are the bridges in the foreground in the photographic view) and also the four grade separation bridges in the Cahuenga pass section, were designed and completely detailed in the Bridge Design Division of the Los Angeles City Engineer's Office. The construction of the first four mentioned was supervised by the State using the City's plans. The construction of the four in the Cahuenga Pass was supervised by the City.

R. W. STEWART
(Retired) Bridge Design Engineer
Los Angeles, Calif.

Engineered to increase your earnings with any truck!

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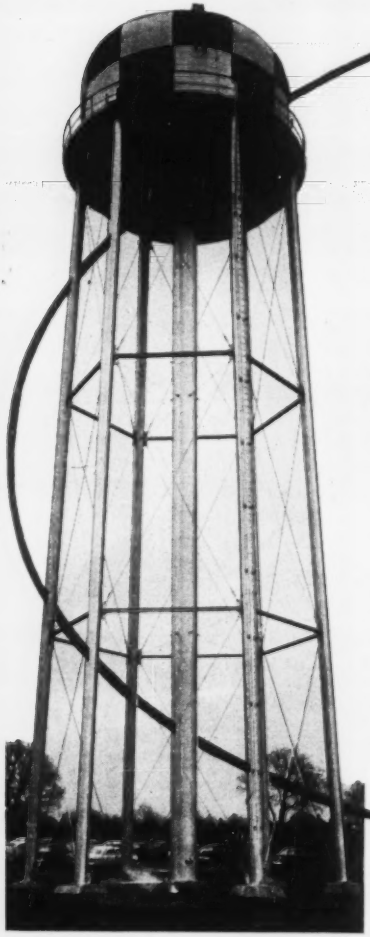

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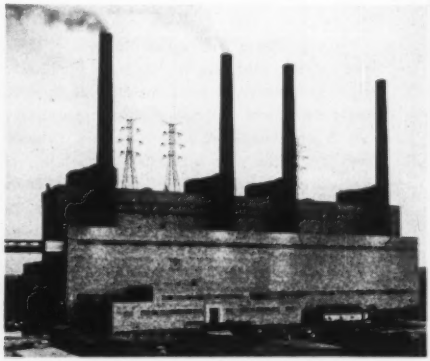

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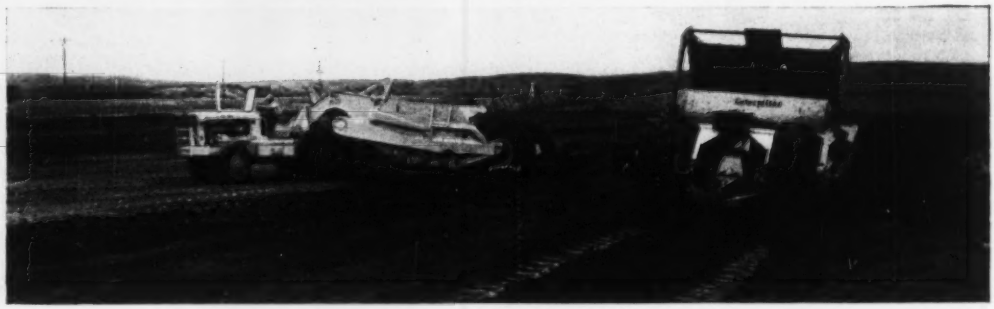

DUMPING SMOOTHLY AND EVENLY, *the DW20 and matching Scraper is ready for a quick return trip.*

In the land of Sitting Bull...

They're moving 35,000,000 cubic yards of earth

BACK FOR MORE FILL *goes the big "Caterpillar" unit, passing one of the "Cat" No. 12 Motor Graders that keeps the haul road smooth and firm.*

THE Western Contracting Corp., Sioux City, Iowa, is rearranging the earth in the area of Pickstown, South Dakota. It is working on an Army Engineers' contract to move 35,000,000 cubic yards of earth for the construction of Fort Randall Dam and Reservoir.

In the end, a rolled earth dam 10,000 feet long and 160 feet above flood plain will rise on the site of old Fort Randall.

Sitting Bull never would recognize his old whooping ground. Not after the way five hustling "Caterpillar" Diesel DW20 Tractors with No. 20 Scrapers have shifted the scenery. It might break the chief's heart, but it pleases Carl Collins, general superintendent of Western Contracting Corp.

"The DW20s are the very best wheel tractors on the market today," he reports. "I ought to know because I've used them all. They're tough and fast."

Wet, Sticky Gumbo—The 5 burly, yellow tractors are moving 4,200 pay yards a day operating in wet, sticky gumbo that makes tough loading and spreading. They are push-loaded by "Caterpillar" Diesel D8 Tractors—Western Contracting owns 25—equipped with push plates. The DW20s wheel through an average of 8.5 trips an hour using a half-mile haul road with an 8 per cent downhill grade.

The "Caterpillar" team on the Fort Randall job includes a fleet of 8 No. 12 Motor Graders which keep the haul road smooth and firm, and 8 "Caterpillar" Electric Sets.

When finished, the Fort Randall Dam will bring flood security and relief from a critical power shortage for thousands of persons in the Missouri Valley.

In helping build the Fort Randall Dam, the hard-working, rugged "Caterpillar" team of equipment is bringing a better way of life to a large segment of the nation's population.

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Controls will stick around

The construction industry—along with most other U. S. business enterprises—is going to have to live with controls for quite a while yet, in spite of a lot of talk to the contrary.

The controls will almost certainly be weakened here and there as Congress rushes to pass something in the way of legislation that won't be too distasteful to too many voters. But the end result will still be controls.

• **Reasons**—The reasons divide themselves into two parts: politics, and what both controllers and others believe to be sound economic reasoning. The political reasons are quite simple—both Republican and Democratic sides want to present the voters with a free economy—but neither side wants to take the blame if by some chance the dropping of controls shouldn't work out too well.

And a check of the people responsible for controls reveals that there is some good economic thinking behind the current drive to preserve at least the essentials—certainly enough to justify the worries of the politicians that a complete abandonment of controls might not work out so very well.

• **Economics**—It boils down to this:

In the opinion of almost everyone concerned (Arnall of OPS, Fowler of NPA, McNeil of Defense, for instance), the same factors that made for the original inflation still exist, and will continue to exist for a long time to come. Those conditions stem, of course, from U. S. attempts to put itself on an even footing with organized Communism.

On the spending side, coming up, are such matters as supplies and equipment for armed forces topping 3.7 million men; for AEC facilities that may reach an added $5 billion within a few years; for further expansion programs in aluminum (if we think we should be completely self-sufficient in that metal); further build-up of production plant generally to provide bases from which to expand in case of need.

In the words of one control official, "We don't want to disband the fire department while there's still the risk of having a fire."

• **Wrong interpretation?**—Reason for the general feeling that controls can now come off is what government officials insist is the public's wrong interpretation of the decontrol (or relaxing) orders that have come out.

They put the picture this way:

First things being first, the immediate pressures for certain war materials and for supplies to support construction and other programs put an immediate pinch on supplies of certain materials.

Now, as the programs come into something like planned form, the pressure for the materials needed first lets up—but pressure for other materials (which may go into the things manufactured by the facilities just completed) goes up as the new facilities come on the line.

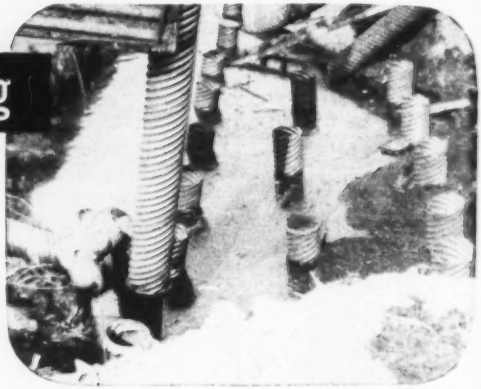
So what the control agencies have been doing is to try to turn some materials back into the civilian economy, but at the same time, put under controls other materials. For instance, NPA has so far decontrolled 27 items, relaxed controls on 45 more (copper and aluminum last week)—but imposed new controls on 25 other materials (mostly alloys needed in hardening steels).

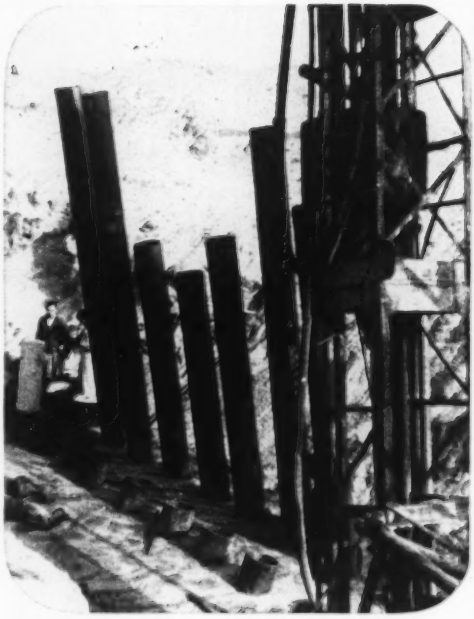
They call that selective decontrol, and see it as a continuous put-and-take process that will go on for a long time.

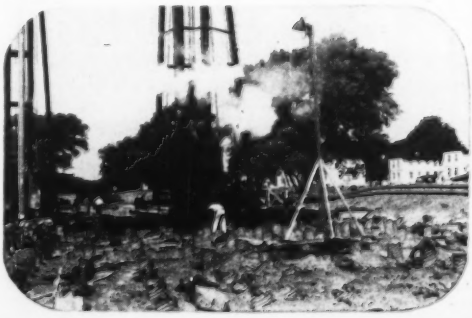
As the controllers (and a lot of Congressmen on both sides of the political fence) see it, the job of feeding back materials to the civilian economy and taking other materials out of that economy from time to time, has to be done through a well-oiled controls machine.

Here is economical piling

for all foundation conditions







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ARMCO
FOUNDATION PIPE

STEEL STRIKE PINCHES HARDER—The steel strike has lasted long enough to start hurting construction and more. Serious building interruptions are in the making, multiplying for every day the strike continues.

By the end of last week, it had cost over 8 million tons of ingot output—or about 6 million tons of finished steel. Of this total, more than 1.2 million tons of finished steel products will be lost to the construction industry. Nearly 325,000 tons of structural production had been lost in the current strike and previous shutdowns; and if the strike goes through this weekend, losses will have climbed to 400,000 tons of structurals or more.

This week structural fabricators across the country who are not strike-bound began slowing down their operations. Nearly all will be slowed down by the end of next week. They have worked their way through a large part of the inventory they had on hand at the beginning of the strike, and supply pipelines are empty.

When the strike ends, the 50% of the fabricators closed by strike will be able to resume shipments of fabricated steel within a week.

But for the fabricators who have been producing since the strike began, the worst will come after the strike is settled. It will take them at least three weeks to get enough steel to resume normal operations, and for many it will be six weeks or more. The time will vary according to the priority of the projects involved. Already strike losses will have the effect of extending steel controls probably through the second quarter of next year.

NOT ALL IS DARK—But last week's NPA action to exempt most copper and aluminum users from direct allocation controls stemmed directly from the effects of the steel strike:

As less steel was used, demand for copper and aluminum dropped. Add to this the fact that the military take of copper has fallen slightly, and the production of aluminum is climbing slightly—and you have NPA's reasons for easing off on the two key metals.

End result is a big boost for homebuilders, a somewhat lesser one for industrial work, no change for public roads and recreational work. NPA's ease-off, specifically, is this:

Homebuilders can self-certify up to 250 lb of aluminum per dwelling (for one to four-family units); up to 50 lb of copper for dwellings with steel water pipes (instead of 35); and up to 175 lb of copper for dwellings with copper water pipes (instead of 135).

Industrial builders can self-certify up to a ton of aluminum per project per quarter (up from 1,000 lb). Contractors on all other construction (except roads and recreational work) can certify 1,000 lb of aluminum (instead of nothing); 750 lb of copper (from 200 lb).

IN THIS ISSUE—Palley commission maps construction's future (p. 21) . . . Building Research Advisory Board makes recommendations (p. 23) . . . Construction row ruffles Congress (p. 24) . . . Irrigation and highways featured at ASCE meeting in Denver (p. 26) . . . Solutions to municipal problems proposed (p. 30) . . . How to control an H-bomb project (p. 36) . . . Composting for profit (p. 44) . . . Man-made hurricane tests windows (p. 49) . . . GM builds dual function plant (p. 53) . . . Iraq makes rapid construction progress (p. 55) . . . F. H. McGraw Co. hit on preferential hiring (p. 60) . . . John P. Riley honored by architects (p. 62) . . . Construction trends projected into 1975 (p. 80) . . . Private construction boosts backlog (p. 82) . . . New products (p. 102) . . . Editorials (p. 108).

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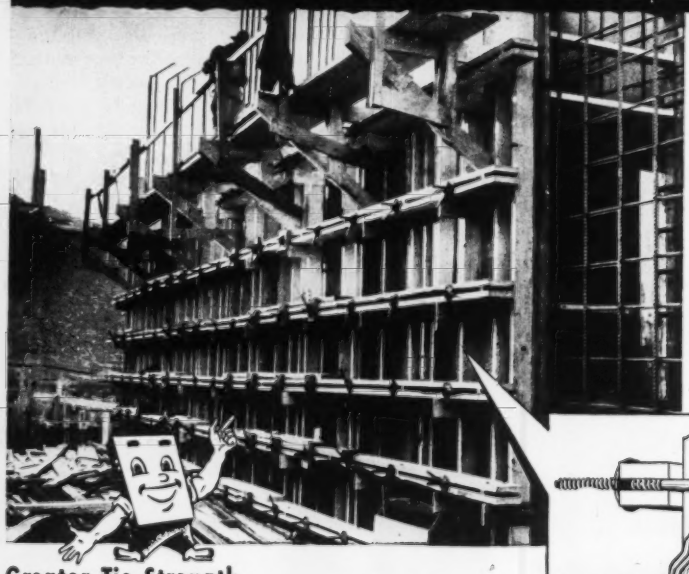

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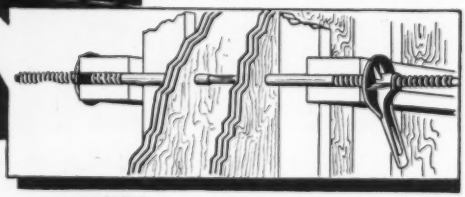

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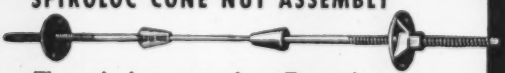

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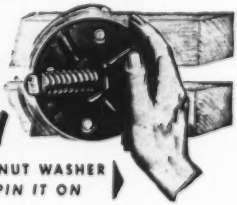

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35% rise forecast for construction

• Paley report gives outlook for 1950-1975
• Recommends revision of building practices

Actual physical volume of building construction in the 1970's may run 35% higher than 1950. So said the President's Materials Policy Commission this week in submitting its report on the resources outlook for the quarter century, 1950-1975.

But to accomplish this increase efficiently, builders are going to have to make sweeping revisions in construction practices, the report warns.

• **The assignment**—The commission itself has done a tremendous job in the 17 months since President Truman appointed the five members, named William S. Paley of Columbia Broadcasting System chairman and handed them his large order: "To study the broader and longer range aspects of the nation's materials problem as distinct from the immediate defense needs."

As the largest user of materials in the U. S. economy, construction gets extensive attention in the commission's study. In a five-page section of its report, (Vol. 1, Chapter 26), the commission turns the spotlight on technical obstacles of the building industry and proposes some drastic correctives, as noted in the table of recommendations on the next page.

"Nowhere," says the commission, "are technological opportunities and barriers to their attainment better illustrated than in the building industry." Many innovations have been thoroughly tested, the report declares. It goes on: "They work; yet they have been put to relatively little use."

• **Building predictions**—Why was construction so important to the commission's study? In 1950, the report points out, construction of new buildings and maintenance of existing buildings took one-third of the copper, one-sixth of the iron and steel, one-fifth of the lead, one-fifth of the zinc and nearly two-thirds of the lumber consumed by all industries in the nation.

For the job ahead, the commission says builders will have to supply by 1975 something in the order of 35 million houses, school facilities for 20 million desks, hospital facilities for 1.4 million beds, 7.4 billion sq ft of factory floor space, and 4.2 billion sq ft of commercial space in warehouses, offices and stores.

Materials needed in building construction will probably be greater than these figures suggest, the report says. Dwellings of the future will not only be more numerous, they may also be larger and better as real income rises. And the overall estimate does not include potential increases in construction of highways, resource projects or utilities.

• **Changes needed**—Technology has the first job of opening up new ways of shifting from scarce to plentiful materials. But there is a second and more urgent problem in getting wide acceptance and use of the new techniques, the report emphasizes. Here man-made obstacles block the path of progress. Today's big challenge to public and private policy lies in clearing away the barriers to efficient building.

As the commission sees them, the obstacles trace back to four roots:

(1) The way the industry itself is organized.

(2) The numerous restraints of trade that prevail.

(3) Inflexibility of most building codes.

(4) Lack of adequate research in the field.

No general remedy is suggested for the loose-jointed character of the complex that makes up the building industry—producers, distributors, builders or contractors, architects, engineers, labor and financial institutions.

"No other important group in our economy," the report says, "bears the burden of financial control and supervision that is imposed on the building industry."

This control reaches down into the detail of the builder's operations, particularly in the case of housing.

• **Consolidation seen**—Experience has shown, the commission states, that it is practically impossible for a small building firm to operate efficiently. The number of larger firms is growing, it observes. Within the limits of healthy competition, the commission says, there is room for more consolidations of small firms into big ones, bringing in producers and distributors as well as builders.

Restraints of trade get sharp treatment in the report. The commission suggests that the Department of Justice and the Federal Trade Commission dig harder into the building and building materials industries and, further, study the need for new legislation to authorize prosecution of restraints that cannot be reached under present laws.

About one-fourth of all cases under the federal antitrust laws have involved the building industry, the report states. The restraints take a variety of forms, it points out: withholding materials, barring new techniques, forming combinations to bar competitive materials, making agreements to reduce bid competition, and writing patent and license agreements to control prices. These practices, expensive to the public, are often abetted by labor, local codes and licensing provisions that have the effect of stifling competition, the report declares.

• **Building codes hit**—Local building codes, avowedly designed to protect public health and safety, have often become devices for protecting select groups in and out of the building industry, at the expense of the general welfare, the commission declares.

There are now some 2,000 local codes, resulting in a multitude of conflicts, a wide range of requirements and many absurdities, the report points out. The diversity of requirements wrecks the chances for manufacturing economies and inhibits building research within the prescribed limits.

Uniform codes that establish standards of performance instead of specifying particular materials and techniques give a large part of the answer to the code problem, the commission states. Further, it says the federal government should adopt national standards—making them the performance type so far as possible—and keep those standards up to date by intensive government research and continuing consultation with technical groups.

More drastically, the commission recommends that the government use its powers in the mortgage field to

What the commission recommends

Paley Commission comes up with scores of proposals for subsidies, new legislation, new federal regulation, buildup of government agencies in agriculture, interior, defense, housing. . . .

I. These directly affect construction:

- Federal government should establish national building codes based on performance requirements, not specific materials.
- No FHA loans to areas with building codes that conflict on materials use with national standards.
- Federal construction standards to apply to all federal construction or any construction on federal lands.
- Intensify antitrust activity "to promote rational, efficient distribution system" in construction and building materials industries.
- Government should specify only performance characteristics of machines or products desired in all procurement, wherever possible.
- Increase financial support of the HHFA housing research program, distribute the research findings through a non-governmental agency like the Building Research Advisory Board, and apply the new knowledge in federal housing and slum-clearance projects.
- Some federal agency to formulate and keep up to date national standards of building construction, with aid of an advisory board representing technical groups and government agencies.

II. These also affect construction:

- Accelerate the topographic and geologic mapping by USGS of U. S. and Alaska, expanding the program by 50% in five years and by 100% as soon thereafter as possible.
- Build some six thousand miles of tap roads to timber areas in the West within five years at a cost of about $30 million per year.
- Continue work by Atomic Energy Commission and utility companies at highest possible level on development of electric power from atomic sources.
- High priority to federal hydropower developments on St. Lawrence, Columbia, and Niagara Rivers.
- Stockpiling should be made permanent; policy should always be to buy at minimum cost.
- Start the St. Lawrence Seaway soon, for transportation purposes.
- National Security Resources Board should be top agency on materials policy recommendations to President and Congress. Annual report should be made public to fullest extent consistent with security.
- Give more attention to industrial needs in future planning of water programs and management of water resources.
- Anti-pollution programs aren't producing results fast enough; they should be applied and supported more strongly, the main responsibility resting with the states.
- Appraise more carefully the economic soundness of proposed federal reclamation projects.

The commission was headed by William S. Paley, chairman of the board of Columbia Broadcasting System. Its members: (1) George R. Brown, of Houston, Texas, a mining engineer, president of Brown Engineering Corp., chairman of Texas Eastern Transmission Corp.; (2) Arthur H. Bunker of New York, president of Climax Molybdenum Co., and director of Lehman Brothers; (3) Eric Hodgins, of New York City, editor for Fortune Magazine; (4) Edward S. Mason, of Cambridge, Mass., dean of Harvard's School of Public Administration, vice-president of American Economic Assn. They assembled a staff of some 120 experts and clerical help who called on dozens of universities, top management and technical men in private industry, and experts in government agencies for reports and advice. The result: five volumes totaling more than 813 pages, all available from Superintendent of Documents, Washington 25, D. C.

compel, in effect, widespread adoption of the national standards by local code authorities.

On this score it proposes that the Federal Housing Administration refuse to insure mortgages in any area that has a building code or zoning law which excludes alternative materials permitted under the national standards. And the same principles, it says, should apply to all phases of the housing program handled by the Veterans Administration. This last proposal would include all VA-guaranteed loans for new houses for home improvements.

• **Research sought**—Increased federal support also is recommended for building research. The commission cites agriculture as comparable to building—made up of a multitude of small, localized, low-capital units.

For farmers, the federal and state governments have taken on the research job. But, for building, the commission sees the government's research role largely as a coordinator and developer of basic standards. The government would become an active participant only where non-government groups could not complete the job.

This has been the method followed by the Housing and Home Finance Agency—coordinating and allocating research projects under contract to both private and government organizations. But Congress has been cutting the HHFA program. The commission recommends continued, increased support of the research activity, with distribution of results through a non-governmental agency like the Building Research Advisory Board.

BRAB is cited in the commission's report as an industry-sponsored group that functions as a clearing house and coordinator for research, but on a too-limited basis because of inadequate support. The commission also mentions the BRAB study of conservation of materials for the Defense Production Administration, reported on the opposite page.

• **Results**—It is hard to say right now what immediate results can be expected from the report. Certainly not much in this election year. But this seems certain: The Paley report will become the basis from which dozens of government-industry disputes or agreements will grow for years to come. Many construction men will disagree with many of the recommendations for government action—but most will agree with the factual underpinning of the report and its critical statements of the situation.

(For more on the Paley Report, see page 80.)

DPA group recommends building changes

Broad changes in building concepts were recommended in a report on materials conservation that the Building Research Advisory Board (BRAB) handed this week to the Defense Production Administration.

In its one-year study for James W. Follin's subcommittee on construction in DPA's Conservation Division, the board and its advisory panels addressed themselves first to the overall problem of how best to use materials in permanent buildings. How to save short materials in a defense emergency came second.

BRAB offers general recommendations in the report; the advisory panels get more detailed and specific in their proposals. BRAB certifies the integrity of the panels, but it doesn't endorse their recommendations in full without further study.

• **For example**—BRAB's report makes a sharp distinction between inferior substitute materials and alternates that are as good as—or better than—historically accepted products. It comes out strong for performance standards—particularly on government work—that freely admit and even encourage the use of alternates.

Then it went on to recommend plan efficiency ratios for office buildings: up to three stories, 85-90%; three to twelve stories, 80-85%; over twelve stories, 75-80%. The panel also recommended for office buildings a 9-ft optimum ceiling height, partition spacing on two-three-or-four multiples of a 4-ft 4-in. module, and a depth from window to corridor of 25 ft for non-ventilated buildings. The panel endorsed modular coordination on the 4-in. module and recommended that it be required in any contract for federal buildings.

An incentive to professional ingenuity of architects and engineers, the panel advised government agencies to throw away standard plans that freeze design. But on one special type of building, the panel says it would be worthwhile for the three military agencies to have one standard general warehouse design.

Instead of standard plans, the panel recommended more government effort to improve programming of building requirements, with special regard for variations in climate in different geographical locations. It also proposed periodic opportunities for outstanding architects and engineers to go all out on new designs for the government, unrestricted by ordinary design standards.

For government office buildings, the panel went into detail in making definite recommendations of usable floor area for six specific uses. The hospital section of the panel report went into equally controversial detail in recommending square foot minimums for 16 descriptions of rooms and services in a hospital.

JAMES W. FOLLIN—His subcommittee surveyed materials use.

Similar specific proposals are made by the other advisory panels. The panel on building envelope and interior, for example, took one approach to the standard for allowable heat transfer; the panel on heating, ventilating and air conditioning took another. Going farther than the second, the first panel proposes minimums in BTU's per hour per cu ft on heated or cooled air space. The other stays with the conventional heat transfer factor of BTU's per hour per sq ft per degree difference between the two sides of the barrier.

In all, the envelope panel makes recommendations in seven categories, totaling 24 separate proposals—from the most general to the most specific. There will be hot arguments over their judgments on roofs, flashing, windows, partitions and metal buildings in an emergency.

• **The purpose**—With the consent of DPA's Construction Committee, BRAB at the outset narrowed the job to fit the time and funds allowed. The contract of a year ago called for a bigger order than William H. Scheick, BRAB's executive director, and the three hundred aides and advisers who helped him, could deliver within the time and money limits.

DPA's contract asked BRAB: (1) to collect information that would help evaluate conservation measures in building design and construction; (2) to review practices in federal building and construction, including military construction.

Scheick and his colleagues telescoped this two-part order into a single package. First they limited the study to permanent buildings—designed for 25-year useful life or longer. Second, they narrowed it down to types of buildings that are constructed by every one of five government agencies they interviewed.

• **Action sought**—In its report on structural engineering, the advisory panel in that department called for faster action in revising occupancy loads for buildings and proposed a formula for the reduction of live loads in terms of the dead load-alive load ratio. It rejected higher working stresses for carbon steel but urged the ASCE-ACI Joint Committee to complete a code of practice for ultimate load design in reinforced concrete and requested government agencies to permit ultimate strength designs as alternates.

Recommendations of the structural panel included four on steel-framed buildings and six on reinforced-concrete structures. On steel-framed structures, the panel urged designers to appraise steel savings obtainable through welding, continuity, cantilever design and composite action of steel beams and concrete slabs.

The reinforced-concrete section recommends frame analysis instead of arbitrary coefficients in designing continuous frames, code provisions for thinner walls, greater freedom in designing slabs, use of welded wire fabric for reinforcement where possible, relaxing of present limits for temperature reinforcement, and more consideration for possible savings through use of precast concrete.

Panel No. 7—on building construction practices—aimed its recommendations at the government. Its report endorses pre-bidding conferences for contractors during the formative stages of design, called for complete plans and specifications on each project, urges uniformity and simplicity in federal specifications, and asked for review of regulations that discourage bidding by competent contractors.

The report runs to 200 pages. You can buy it from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. With your order, send a check or money order for $3.50 made out to the Treasurer of the United States.

Construction rows ruffle Congress

The friction between Congress and the Bureau of Reclamation was heightened last week when the House Interior Subcommittee abruptly terminated hearings on the Hell's Canyon project. The bureau has been pressing for approval of the bill which would authorize start of work on the $357-million dam and power plant at Hell's Canyon as the first link in the Snake River reclamation project.

As the Engle subcommittee was preparing to hear opposition witnesses from Idaho, Rep. Norris Poulson moved to recess the hearings until further notice. Not even Committee Chairman John Murdock, objected.

"There really wasn't time to finish action on the bill this session," Murdock said. "My main purpose in holding hearings was to get a record established. I haven't visited the Hell's Canyon site and recessing the hearings will give me a chance to study the testimony."

But Republican members of the committee claim there is a lot more than the time factor involved in halting the hearings. They have been irritated by the attitude of the bureau on the legislation and took particular exception to reported remarks made by Commissioner Michael Straus in Idaho to the effect that he didn't expect the legislation to get through this session and that the hearings were merely to "educate the committee."

"We've had enough education," said Rep. John Saylor (R. Pa.), "so I guess it's time to stop. What the committee doesn't like is the attitude of Straus and the bureau and unless they change it, they may jeopardize a lot of worth-while legislation.

"The bureau has no consideration for the committee. To give you an idea, they refuse to come to meetings when we invite them and take the position: 'Let the committee handle it.'

"Whenever the bureau is willing to cooperate with the committee we will be more than glad to work with it," Saylor continued, "but we're getting fed up with their present attitude which amounts virtually to contempt for the committee."

Recently the committee asked the Comptroller General and the Attorney General for an opinion on whether the bureau violated the law in exceeding a congressional authorization on the Eklutna, Alaska, project.

Some committee members feel that the bureau has persistently overspent authorizations on the assumption that the committee would bail them out. They feel the only way to make the bureau halt the practice is to get a ruling that the bureau has overstepped legal bounds.

• Housing controversy

Six months of off-and-on hearings into charges of defective Veterans Administration and FHA-sponsored housing wound up ineffectually last week, as the House Rains subcommittee finished its work for this year.

The hearings actually produced no concrete results, and will not likely produce any legislation. But they did point up a number of things:

1. Generally speaking, the charges of shoddy work that flew thickly at hearings in various cities do not constitute anything like a general indictment of the construction industry.

2. Very little of the evidence was properly prepared and substantiated.

3. Congress can see little that can be done about the situation from a legislative viewpoint, other than instructing the agencies concerned to tighten their inspection procedures.

Subcommittee Chairman Albert Rains indicated at the close of last week's hearing that his committee was in agreement that there had been many poorly built projects, but added that in general such jobs have been exceptions—prominent ones, but exceptions nevertheless—in view of the tremendous volume of housing built since the end of World War II.

BUILDER David Muss, San Antonio, Texas, defended homes he built.

And he reflected the committee's attitude toward the results of its arduous schedule in an interchange with reporters, who asked if there would be further sessions.

Said Rains: "Certainly not. We're trying to adjourn Congress this month."

• **Repetitions**—The committee's record of hearings in ten major centers (including New York, Miami, Detroit, Corpus Christi, New Orleans) showed remarkably similar charges and refutations in almost every instance.

The final five-hour session in Washington (on charges involving VA-insured housing at Wright-Patterson Air Force Base near Dayton, Ohio), was typical.

Charges included shoddy construction, influence in Washington, excessive profits and unsafe location. All were denied by David Muss, San Antonio, Texas, building contractor involved.

Representative Paul F. Schenck, R., of Dayton, demanded an investigation of the FHA officials insuring the project, Air Force officials who approved the builder, and the builder himself. Most of Schenck's anger was directed at the stucco exteriors, alleged lack of fire walls, and generally poor construction practices.

Muss had called upon the testimony of representatives of the National Gypsum Co. and the Keystone Steel and Wire Co. to buttress his denial of Schenck's charges. They declared Muss was complying with accepted building practices and that the material was adequate for the job.

Air Force Colonel E. V. Schuyler explained the procedure for selecting sponsors of Air Force housing projects. Final approval of Muss, he said, was made in Washington by a board unknown to the builder. He said there is no way personal contact or pressure could be exerted.

Three Dayton builders, Jack Stein, Robert L. Pine and Ralph Sharp, presented testimony challenging the building practices used in the project, and reported Dayton rumors that influence and high profits had been involved.

Thomas Berry, director of FHA's Cincinnati, Ohio, office said that the only complaints that he received were promptly remedied by the builder, and no faults were now known. There are

three full-time FHA inspectors on the job now, Berry said.

The committee was authorized by House Resolution 436 last October to investigate defective housing constructed under FHA or VA housing programs. It was organized in January; has held hearings or investigated projects in the Southeast, Middle West and South, plans no further hearings at this time.

• Civil functions boost

The Senate passed the Army-Civil Functions Appropriations bill calling for an increase of $175,039,799 over the House-passed appropriations of $492,434,900. The differences will have to be worked out in conference.

As finally passed, the Senate version provides $667,474,699 for Army civil functions, construction funds broken down as follows:

Rivers and harbors.....	$277,135,600
Flood control	302,777,200
Miss. River & trib.....	62,520,000
Sacramento River.....	1,000,000
Niagara power devlpmt..	900,000

Some of the more important projects restored by the Senate. Under rivers and harbors, $30 million for The Dalles power project in Oregon and Washington; $5.2 million for Cheatham Dam on Cumberland River in Tennessee; and $3 million for Ice Harbor Dam on Snake River.

For flood control: $10 million for Tuttle Creek Reservoir on Big Blue River, Kans., to be operated as a dry dam without power or recreational facilities; $13 million for Gavins Point Reservoir in Nebraska, one of major dams in the Pick-Sloan project; and $4 million for the Hartwell Reservoir in South Carolina and Georgia, to be used in connection with AEC installations on the Savannah River.

• Military construction . . .

. . . A Senate Armed Services Subcommittee got down to work this week on the Military Construction Authorization bill and indications were that substantial cuts would be made in the bill before the subcommittee turns it loose. The military chiefs, who testified before the subcommittee this week, asked restoration of $250 million for NATO bases in Europe that had been deleted by the House when it authorized $2,758,318,000 for construction of military and naval bases. However, there is little likelihood that the committee will go along with this request. Sen. Russell Long (D., La.), chairman of the subcommittee, led the fight in the Senate to cut mutual security authorization and after failing to get a half-billion slash, finally whittled the authorization by $200 million. The House deleted the $250 million for NATO bases on the argument that such funds should come from mutual security rather than U. S. military authorizations. Senator Long has support among subcommittee members for not only turning down the request to restore the NATO base items, but to make further cuts in the House-approved funds. Bulk of the authorization, as passed by the House, would go to the Air Force for the construction of overseas bases.

• St. Lawrence Seaway . . .

. . . The Senate by a 43-to-40 vote sent the St. Lawrence Seaway bill back to committee last week after three days of debate. The bill, which would authorize joint participation with Canada in the project, returns now to the Senate Foreign Relations Committee where it has reposed most of the time since it was first introduced thirty-odd years ago. In seeking recommittal, Foreign Relations Committee Chairman Connally (D., Tex.) said the legislation has been before his committee so long that it would feel lonely if it were not there. The legislation is now dead for this session and some proponents think dead forever as they feel Canada will go it alone on the seaway development as the result of Congress' failure to approve it.

• Housing aid voted

In testimony before the House Banking Committee, spokesmen for the government and for private home builders this week endorsed a Senate-passed bill designed to spur home construction in defense and disaster areas. The committee hopes to clear the legislation for final congressional action before Congress quits for the political conventions next month.

The bill would permit the federal housing to insure an additional $400 million worth of mortgages and allow the Federal National Housing Administration to purchase an additional $900 million worth of mortgages on defense and disaster area housing in addition to the $2 billion it already has.

Alan E. Brockbank, president of the National Association of Homebuilders, said the legislation is needed to spur defense housing. Raymond M. Foley, head of the Housing and Home Finance Administration, agreed.

. . . The Senate Appropriations Committee this week approved $560.6 million for the Interior Department for the next fiscal year—an increase of $74 million above the $486 million voted by the House.

NEWS BRIEFS

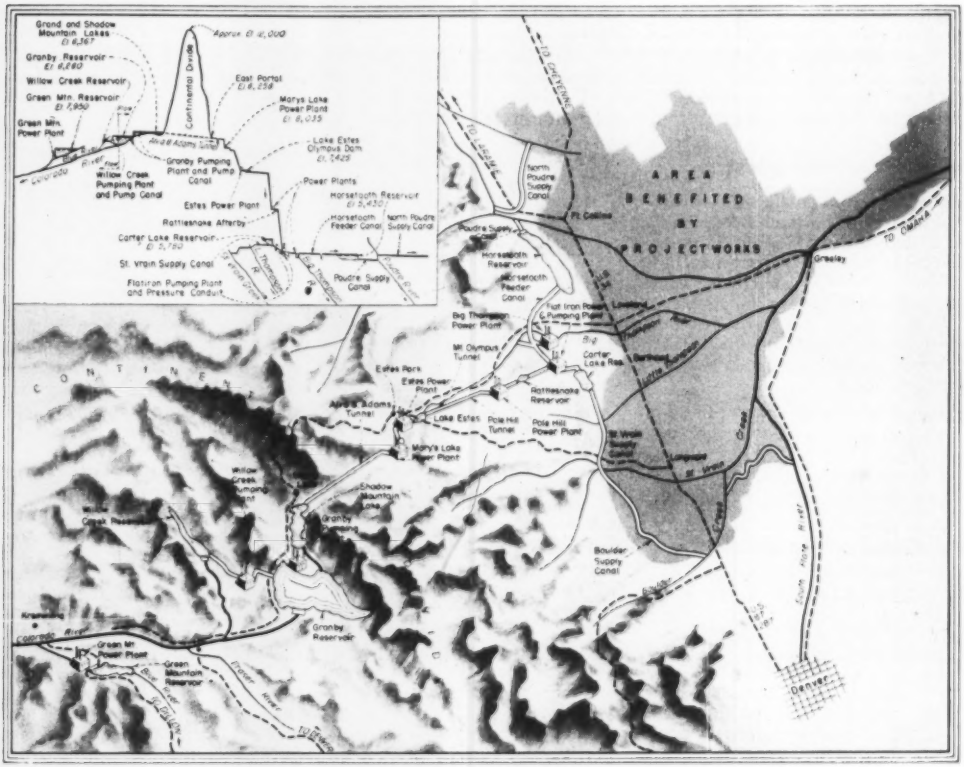
• **Bridge factory**—The first and smallest of a number of prestressed bridge decks that Brown County, Wis., will erect this summer—all to be factory produced by the F. Hurlbut Co. of Green Bay—emerged from the production line two weeks ago. Two hours after it was delivered to the site, traffic began crossing it. Spanning 18 ft, each of its nine prestressed deck sections is 20 ft 6 in long, 3 ft wide and weigh 5 tons.

• **Decentralization**—Union Carbide & Carbon Corp., last week disclosed plans to relocate its 3,000-person New York office staff in a new building on a 286-acre site near Elmsford in Westchester County. Architectural plans are for a series of two-story garden-type office buildings to cost $12.5 to $17 million.

• **Tunnel expedited**—At the rate New York City authorities are expediting plans for a new $90-million third tube for the Lincoln Tunnel, construction will start within a few months for completion in 1957. The Board of Estimate and the City Planning Commission have geared to clear arrangements for street improvements at the tunnel's Manhattan end before the summer recess.

• **Flood damage lessens**—Man gained an ally in Mother Nature in the fight to save California's San Joaquin Valley from disastrous floods. Unusually cool weather for May and June permitted a gradual melting of the snow. A total of 81,000 acres of the Tulare Lake Basin was flooded. The Army's early forecasts indicated 100,000 acres would be inundated at a loss of $10 million. Army officials say the damage estimate will have to be revised downward. The northern San Joaquin Valley, according to Army hydrologist Walter Parsons, "weathered the storm largely by a miracle." The only damage from high water in the Sacramento Valley was through seepage from the Feather and Sacramento Rivers to nearby farms.

• **Philadelphia port**—The House Public Works Committee last week approved a plan for a multi-million-dollar development of the Delaware River Port at Philadelphia, Pa. Approval was reached through a compromise acceptable to the committee and to Pennsylvania and New Jersey. The plan will permit the collection of tolls for 50 years from the date that the "latest" bridge or tunnel across the river is opened.



COLORADO-BIG THOMPSON PROJECT for power and irrigation was the showpiece of the ASCE convention. Begun a dozen years ago, its mountain features are finished, with work now concentrated on the power plants and reservoirs in the foothills.

Irrigation and highways featured at lively ASCE meeting in Denver

By Waldo Bowman
Editor

As was natural for Colorado and Denver, the summer meeting of the American Society of Civil Engineers held there last week offered a program that was dominated by papers on irrigation and water problems. Denver being the terminus of one of the nation's newest toll roads and a growing city beset with traffic pains, made highways and streets another logical subject.

Among the total of 70 papers on the program, such other fields as foundations, buildings, airports, waterways, surveying, sanitation and engineering mechanics were also represented.

Adding to the emphasis on irrigation and water use was the coincidential commemoration of the semi-centennial of the U. S. Bureau of Reclamation. It was marked by a special session of the convention held at the extensive laboratories of the bureau just outside Denver, and also by formal dedication ceremonies for the Colorado-Big Thompson project, now entering its final construction stages in the foothills of the Rocky Mountains about 50 miles north of Denver.

Somewhat more than 800 persons registered for the convention which was master-minded and managed by Walter E. Blomgren, assistant chief engineer, Bureau of Reclamation and president of the ASCE Colorado section and by Alfred J. Ryan, consulting engineer, Denver.

• **Water from over the divide**—Of the few papers that a highlight report of this kind can note, those that reveal the present status and some of the important details of the Colorado-Big Thompson project take top billing. One of these by Herbert E. Prater, regional engineer of the Bureau of Reclamation, covered the project as a whole, while another by S. M. Denton and H. L. Neve, design engineers, related to the power features.

Although one of the most complex projects the bureau has undertaken in point of number of elements involved, the principle of this $157-million trans-mountain water diversion is relatively simple. It takes its name from the fact that Colorado River water from the western slope of the Continental Divide is moved under the Rockies in a tunnel to the Big Thompson River on the eastern slope.

The basic purpose is to provide irrigation for water-deficient lands in the South Platte River valley. At the same time, the necessary 2,800-ft fall of the

water from the mountains to the valley floor is utilized to generate electricity, estimated at about 600 million kwh per year.

By reference to the map it will be noted that western slope water is impounded in a reservoir behind Granby Dam from which it is lifted by pumps 181 ft into Shadow Mountain Lake, an artificial extension of existing Grand Lake. From here the water flows by gravity under the Continental Divide in the 13-mile, 9.75-ft diam Adams Tunnel. All these facilities are completed and in operation, as are the other two reservoirs to be noted on the western side. Green Mountain Reservoir is not a part of the system, but a part of the project since it impounds Colorado water that is used to regulate the flow in that stream that might otherwise be upset by the trans-mountain diversion. Will Creek Reservoir water is pumped into Granby Reservoir to augment its supply.

When the water emerges from Adams Tunnel on the east side of the mountains it drops through tunnels, siphons and penstocks, first to Marys Lake power plant (9,000 kva) and then to Estes Park power plant (50,000 kva). These facilities are also completed and in operation. From here on through the foothills and out onto the plains, construction is still underway.

Water from the Estes Park power plant is presently being released into the Big Thompson River, but it will later follow a tunnel line about 4 miles south of the river. It will pass through Pole Hill power plant (35,000 kva) and then to the Flatiron power and pumping plant (69,700 kva) on the edge of the area to be irrigated.

Flatiron is a division point, part of the water flowing north by gravity to Horsetooth Reservoir and part pumped south to Carter Lake Reservoir. It is from these two reservoirs that water will be released into the extensive system that will irrigate a 700,000-acre area.

One of the interesting features of the current work is the planned installation in the Flatiron plant of a combined pump-turbine unit, which will operate as a pump in lifting water into Carter Lake Reservoir, but which may also be reversed in direction of operation and serve as a water-wheel generator, actuated by water flowing backward from Carter Lake Reservoir. When acting as a pump, it will deliver 370 cfs against a head of 240 ft when operating at 300 rpm; at the same speed as a turbine, it will have a capacity of 10,000 kva. The Flatiron plant will be the dispatching center of the distribution system.

Another novelty of the project is the transmission of power from Estes Park power plant westward under the Continental Divide in the same tunnel that brings the water eastward to generate the power. Power, may, of course, also be transmitted eastward from the plants on the western slope. The transmission conduit consists of three cables wrapped in oil-impregnated paper and enclosed in a steel pipe about 6 in. in diam which is filled with nitrogen gas at about 200 psi, to assure watertightness. It is suspended from the crown of the tunnel.

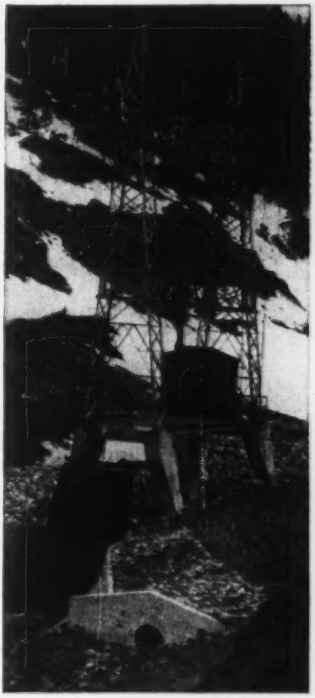
• **More water for Denver**—Colorado-Big Thompson is not the only or the first instance of bringing west-slope water under the mountains to the east. Denver has been getting such water from the Fraser River since 1936 in a pipe installed in the 6.3-mile Pioneer Tunnel that was used as an aid in driving the Moffat railroad tunnel. Such mountain supply was necessary to supplement the erratic supply from the South Platte River. And it was well that such additional water was provided, for Denver's population increased 29 in the 1940-50 decade.

E. L. Mosley, manager of the Denver Board of Water Commissioners, pointed out that this growth shows no sign of slowing down, and that as a consequence two consecutive expansion programs are in the works—a five-year, $30-million program beginning in 1947 and now nearly completed, and an eight-year, $46-million program begun this year.

Of the five-year program, distribution and filter additions have been completed and work is underway on a new dam to impound water that comes through the Moffat Tunnel. Called Dam 22, it is located on South Boulder Creek and will create a 42,000-acre ft reservoir. It is of arch gravity type 340 ft high and 1,002 ft long and will cost $12 million when completed in 1954.

There are still opportunities for Denver to store and use more efficiently the water available from the Fraser and the South Platte Rivers, and this is the objective of the new eight-year expansion program. When this is carried out the present per capita consumption of 191 gal per day can be supplied a population of 725,000 persons, as against the present population of something less than 500,000.

After that a new source must be developed, and Denver has plans underway for another trans-mountain diversion from the Blue River. This will require a 22.8-mile tunnel, a large amount of money and the cooperation of the federal and state governments in granting water rights. Lack of the water rights is the present stumbling block that makes the project a dream rather than a definite plan for the future.



COLORADO-BIG THOMPSON FEATURE—Power line carried in Continental Divide water tunnel. Housing is for nitrogen gas that moisture-proofs the cables.

• **Professor proves successful promoter**—To the many fabulous people who have contributed to the spectacular history of the Denver mountain area must now be added another. Unlikely as it may seem, he is a professor of civil engineering at the University of Colorado, and the justification for his fame lies in the fact that he has successfully and single-handedly promoted a toll road. Prof. Roderick L. Downing, who is now also a member of the State Highway Commission, described his Denver-Boulder Turnpike before the society's Highway Division.

It may truly be said to be his, for he first envisioned such a route for the 18-mile distance some 25 years ago, and in the meantime used it in his classes to demonstrate the principles of highway benefits. This was not difficult since the proposed route was 8 miles shorter, yet the State Highway Department would never accept it, and finally dared the professor to organize a company and build it as a toll road. He took the dare, but instead of a company he got the state to pass legislation that permitted it

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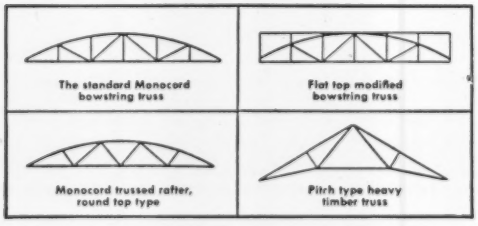
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SUCCESSFUL PROMOTER—Prof. Roderick L. Downing of University of Colorado overcame all opposition to Denver-Boulder Turnpike.

to be built as a public toll project.

Steps in the promotion and development were as follows: In 1940, complete cost-benefit estimates were worked out and presented as a paper before the university's annual highway conference; in 1937-38-39 location surveys were run on the north portion of the route by students as a part of their course in curves and earthwork; continuous talks by the professor to clubs and business groups, in succeeding years, got widespread agreement on the road; in 1946 secured the support of the governor and the legislature; in 1946 used twenty-two students working Saturdays and Sundays to survey the entire route; in 1948 engaged Howard, Needles, Tammen & Bergendoff to make a study of the economic feasibility of the project and received the report that income would not be sufficient to cover expenses; in 1949 got the enabling legislation passed and in 1950 had its constitutionality upheld by the State Supreme Court; in 1950 engaged Howard, Needles, Tammen & Bergendoff to prepare designs and specifications; in 1950 sold $6.3 million of bonds at an interest rate slightly below the 3% maximum allowed by the legislature; let first construction contract Sept. 30, 1950 and last one Feb. 1, 1951.

The Denver-Boulder Turnpike (ENR Dec. 6, 1951, p. 36) has been in operation since Jan. 21, 1952. In the first three months it carried 363,000 vehicles and showed a profit of $60.77 per day.

"Toll roads are not the answer to our perplexing highway finance problem," says Prof. Downing. But their greatest usefulness, in Professor Downing's opinion, is in educating the public to the fact that highways are a necessity and not a luxury, and that a good road returns more benefits than the cost to finance it.

The need for this conviction was pointed up in another paper by Dan W. Ormsbee of the State Highway Department. Citing the need for a modernized highway from north to south across the state, with connections to the state's five largest cities, he cited a cost of $25.8 million. This year $1.8 million is all that can be allocated to this job, which thus would require 14 years to complete. "Some new means of financing must be found," Ormsbee concluded.

In addition to these papers on projects of broad import, the program contained many papers that were of equal significance technically. Several of these are particularly worthy of note.

• **New type penetrometer**—For the foundation exploration for the new Denver Coliseum, located over gravel deposits underlain by soft shales, a new large-size penetrometer was developed.

Ralph B. Peck, research professor of soil mechanics, University of Illinois and consultant on the work, stated that the base diameter of the penetration cone was made 2½ in. to minimize the effect of any boulders. A 350-lb driving hammer was used with a fall of 2 ft. The penetrometer was driven into the ground at the bottom of a 2-in. diam drill rod. The rod was removed, but the cone left in the ground after the shale was reached at a depth of about 50 ft.

The number of blows for each foot of penetration was determined and, by making two soundings at the proposed location of each footing, the characteristics and boundaries of the granular deposit were learned. The results were checked with three standard penetration tests made with a split spoon sampler, which confirmed the accuracy of the large-size penetrometer as well as its rapidity and inexpensiveness; two or three soundings could be made per day, as compared with one standard penetration test every three days, according to Professor Peck.

• **Two-hinged circular arches**—The new fieldhouse for the University of Wyoming is framed with two-hinged steel beam arches of 221-ft span resting on steel A-frames. The arches were made circular instead of the more usual parabolic shape, which, according to Milo S. Ketchum, consulting engineer, Denver, has the advantage of making the milling angle on the ends of all the arch segments the same.

At the same time, the bending moment is not much larger than for the parabolic shape. After designing the arches first by the most careful analytical methods and then by semi-graphical methods, Mr. Ketchum concludes that the latter can be used without the "loss of real accuracy."

The greatest problem was to obtain the necessary accuracy in the milled ends of the 18-ft arch segments.

Each one had to be milled separately, and the template used had to be made with extreme accuracy to assure the desired results.

• **Morning glory spillway**—New and relatively reassuring data on the operation of morning glory spillways were reported by J. N. Bradley, hydraulic engineer, Bureau of Reclamation. The lack of such information has probably been the principal reason why more such spillways have not been built, considering their theoretical advantages and their fine operation in model tests.

To secure operating data on spillways that have operated, Mr. Bradley sent a questionnaire to the operators of the 25 morning glory spillways that exist in the world today. The first was built in England in 1896, the second in Wales in 1916, and all of the rest since 1925.

The Bureau of Reclamation's Owyhee Dam Spillway is the largest in the U. S. which has operated. It has a capacity of 30,000 cfs and drops the water 300 ft in the vertical shaft. TVA's spillways at Wautauga and South Holston Dams have capacities of 60,000 cfs and a drop of 300 ft, but have not operated. Presently under construction is the Bureau of Reclamation's Hungry Horse Dam Spillway, which will have a 50,000 cfs capacity and a drop of 475 ft.

From the returns on the questionnaires it is learned that no erosion of a serious nature has occurred; that logs falling down the shafts of four of the spillways have gouged out small areas of concrete; that vibration and noise have not been sufficient to be objectionable; and that in no case has debris or ice presented any unusual operating problem.

Although Mr. Bradley regards these facts as encouraging, he does not set them down as conclusive, and urges that operating data be continuously collected and analyzed. In the meantime, morning glory spillways should be built with unusually smooth surfaces, exact alignment and with no

HOW TO HANDLE
WET JOBS

#7 of a series

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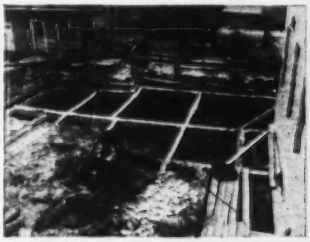
Contractor: Wise Contracting Co.



BOTTOM VERY UNSTABLE. Open pumping caused sheeting to collapse. View shows job shut down after second attempt to sheet hole.

WITH WELLPOINTS. Job is bone-dry, bottom firm and stable—Griffin Wellpoint system (see pumps, top of photo) holding ground water 3 ft below subgrade.

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construction joints in the vertical bends.

Someplace to hide

Engineers met last week at Massachusetts Institute of Technology, Cambridge, Mass., to compare notes on the effect of the atomic bomb on buildings. They thought they could, thus, uncover some clues to a method for designing structures to resist the blast and heat released by the bomb.

The conference, which had been given the name "Building in the Atomic Age," however, was stumped almost from the beginning by government censorship. Information on the energy-release to be expected from modern atomic bombs is being withheld for security reasons. Therefore, heat and blast forces are complete unknowns.

Assuming a nominal bomb, researchers endeavored to determine the behavior of a building when struck by the blast at a distance of about a half mile or more from "ground zero." They point out that in making an analysis, it is necessary to use a dynamic, or impulse loading. An equivalent static load may in some cases yield misleading conclusions.

Dynamic-load analyses, however, are complicated, if all factors involved are considered. Some speakers held out the hope that as more information becomes available it might be possible to ignore or approximate some of the factors and consequently a simple, rapid method of analysis might be developed.

As the conference proceeded, it became quite clear that little or nothing could be done to save structures close to ground zero. But a lot could be done for structures in the fringe areas: (1) They should be well dispersed. (2) Combustible materials incorporated or contained in them should be reduced to a minimum. (3) Fire-resistive construction should be used. (4) First-aid, fire-fighting groups should be organized. (5) Structures should be designed to resist lateral impulse loads; structural framing should have rigid connections, be made of strong, ductile material; and advantage should be taken of the energy capacity of the material in the plastic range. (6) Essential activities might be sheltered underground.

The program was arranged by the MIT Department of Civil and Sanitary Engineering. Robert J. Hansen, associate professor of structural engineering, was chairman of the conference.

More complete details of the papers presented at the conference will be given in a subsequent issue.

MUNICIPAL

CO-CHAIRMEN of conference on urban problems held in Portland, Ore., were Harold Hammond, (left) and F. S. Fitzpatrick (right), of U. S. Chamber of Commerce.

American cities under attack by strangulation and decay

Many warnings of the ultimate fate of American cities due to strangulation by traffic, and decay due to decentralization were heard and discussed at a recent conference in Portland, Ore.

The Fourth National Conference on Urban Problems met in Portland June 23 and 24. The conference was under the sponsorship of the U. S. Chamber of Commerce.

These conferences were initiated right after the last war "to develop leadership among local businessmen to solve urban problems."

The conference was attended by businessmen and interested civic leaders plus government officials—state, county, municipal and federal.

The conference consists of four panels lasting half-a-day each. The panels had six members who were limited to a five minute opening speech. Then the panel was opened to questions from the floor.

The questions developed the information by evoking further discussion.

Credit where credit is due

These men supplied—by their speeches and writings—the material found on the following pages:

Max S. Wehrly, director of the Urban Land Institute, Washington, D. C., discusses the relationship between urban redevelopment and the city plan. (p. 31)

Nathaniel S. Keith, director Slum Clearance and Urban Redevelopment of Housing and Home Finance Agency, Washington, D. C., writes on progress in urban redevelopment. (p. 31)

Alan E. Brockbank, Salt Lake City, Utah, president of the National Association of Home Builders, talks on rehabilitation of blighted areas. (p. 31)

Herbert S. Fairbank, deputy commissioner U. S. Bureau of Public Roads, Washington, D. C., speaks about the role of the federal government in urban highway financing. (p. 32)

Thomas E. Willier, director Department of Traffic and Transportation of the City of Houston, Texas, reports on the Gulf Freeway. (p. 32)

Frank C. Balfour, chief right-of-way agent, California Division of Highways, commented on the effects of by-passes on business. (p. 32)

Frank E. Cox, sales research and business development analyst of the Kawneer Company, Berkeley, California, discusses the parking problem and off-street parking in smaller cities. (p. 35)

Lyman E. Wakefield, president Downtown Auto Park, Inc., Minneapolis, Minn., took as his subject the Minneapolis Merchant Parking Corporation. (p. 35)

Cities fight obsolescence by redeveloping blight areas

- **Why our cities are decayed**
- **Progress in urban redevelopment**
- **Private enterprise fights slums**

Cities today are struggling with the problem of adjusting their physical plant to fit new developments in transportation, communications, power and industrial production.

They were, for the most part, founded during the days of the gas and kerosene lamp. Buildings, streets and the location of homes, business and industry were pretty well fitted to the limitations which the facilities of the 18th and 19th centuries imposed.

Because of the rapidity with which growth has occurred, we are inclined to look upon the spread of urban development beyond city boundaries with its open character and irregular extent as "decentralization." In most cases it represents little more than urban growth, which is taking advantage of a new freedom from the era of the gas lamp and horse car. These advantages are being built into new developments.

But what about the central areas of cities which were geared to an earlier period? With the dramatic growth of new urban areas has gone the more gradual and less dramatic decline of old central city sections.

There are, however, at least three essential ingredients which must be recognized if the process of redevelopment or renewal is to succeed.

The first of these is the recognition that the city as a public entity has a large stake in its own welfare.

The second is that redevelopment must produce the best results for the city from the economic, as well as the physical and social points of view.

The third is that the cost of acquiring and clearing slum areas will in most cases be greater than the new use value of the redeveloped land.

Enactment by the Congress of the legislation authorizing federal financial assistance for urban redevelopment resulted from years of intensive study of the problems of blight and congestion in the core of American cities. The potential solution to this basic problem was offered by Title I of the Housing Act of 1949.

In Chicago, for example, two projects illustrate the characteristic range of redevelopment opportunities under this program. In one southside slum area of 101 acres originally housing 3,600 families, construction has started on a redevelopment program financed by private insurance capital which will ultimately produce 2,000 units of moderate rental housing with supporting commercial and community facilities. In another 53-acre blighted residential tract on the near westside, operations will soon commence on an industrial redevelopment program that will provide the basis for needed light industry expansion in a district excellently served by rail and highway transportation.

The 130 acres in the first Detroit redevelopment project, which previously returned $107,000 a year in tax revenues, will yield an estimated $341,000 in revenue upon completion of the new improvements. As another example, the first four New York City redevelopment areas which have returned $930,600 a year in taxes to the City Treasury will yield an estimated $2.7 million a year after redevelopment.

Today, there are 165 communities at work in redevelopment programs, including almost all of the principal metropolitan areas as well as many smaller localities. In 54 of these communities some 81 project areas have been selected which are at or are near the stage of execution. In the other 111 communities, projects areas are currently being selected.

• **Fighting slums**—It is possible to have cities without slums. The formation of slums can be stopped, and blighted areas rehabilitated in some cases by the use of one weapon—enforcement of existing laws regulating health, building standards, safety and sanitation.

Slums are a result of neglect. When a municipality stops neglecting its slums, then slum formation is stopped. A pattern of slum rehabilitation, already perfected in Baltimore, could be followed in nearly every city throughout the nation.

Known as the Baltimore Plan, this weapon has cleaned up 16,000 Baltimore slum dwellings, and has been adopted successfully by other cities.

Baltimore is a city over 300 years old with more than a million population: 40% of that population used to live in slums covering 2,100 blocks. Since the plan has been in action, areas which had been rock-bottom slums have won garden prizes, and occupants are buying their own homes.

This success was achieved by strict adherence to local laws, and by court action in cases where owners would not act on the committee's request. Total administrative cost of rehabilitation was .004 cents per unit, per person in Baltimore.

MAX S. WEHRLY: "Urban redevelopment is not synonymous with slum clearance."

ALAN E. BROCKBANK: "When a municipality stops neglecting its slums, slums are stopped."

Cities unfreeze traffic jams and merchants get benefit

- **Federal aid to cities**
- **Is a freeway a sound investment?**
- **Does by-passed business suffer?**

The role of the federal government in urban highway financing is an extension of its earlier role in the financing of improvement of the primary rural highways.

In 1916, when the original Federal-Aid Road Act was enacted, 48 states were separately attempting to deal with the staggering problem of the rural roads. Improved roads in each state often failed to connect with roads improved in the neighboring states.

After five fumbling years, the Federal Highway Act of 1921, gave common direction to the efforts of all states. Thereafter, the common necessity to apply and match the never-large federal contribution was the powerful coordinating force that resulted in two decades in a system of main roads interlacing the entire country.

By the late thirties a reversal of need had occurred. The swollen streams of city traffic were beginning to congest city arteries. The mud of rural roads had given way to the muddle of city streets.

From 1939 on the Bureau of Public Roads brought to Congressional attention the altered situation. The Congress acted in 1944, and the first of the federal-aid appropriations authorized specifically for urban highways became available in 1946.

The provision followed the pattern of the rural highway program. The annual federal-aid authorization is apportioned among the states in proportion to their respective urban populations. The funds are expendable in cities of 5,000 population and more.

Since 1946, including the funds authorized for the fiscal year beginning July first, a total of $850 million of federal aid has been made available. The matching contributions raise the total to at least $1.75 billion.

• **Is it sound?**—Is an urban freeway a luxury or a necessity? Can the construction of a modern-type freeway be justified on the basis of utility value as a sound investment?

When the Gulf Freeway is opened for the entire distance of fifty miles between Houston and Galveston in July, the total expended for construction and acquisition of right-of-way will reach a figure of approximately $29 million.

Economic surveys have revealed that the Gulf Freeway is reducing travel time by 50%. Applying nationally accepted figures for time savings of 2 cents per minute for automobiles and 5 cents per minute for commercial vehicles, it has been estimated that the value of time savings after 4 years of use of the Freeway will equal the cost of the new roadway.

Owing to added accessibility provided by the Freeway, abutting property is being used extensively for industrial and manufacturing purposes and for wholesale business. Land values have increased from 6 cents per sq ft in some undeveloped areas to over one dollar per sq ft. A recent survey conducted by the Texas Highway Department has revealed that property values within the zone of influence of the Freeway have increased 65% more than the increase for other properties throughout the city of Houston. This increase in property values in the zone of influence would be sufficient to retire the right-of-way cost of the Freeway in about 9 years.

• **By-passed business**—What happens to retail business when through traffic is moved from its district?

First, if the by-pass is a conventional highway with unrestricted access from abutting property, it will prove detrimental to the established business district. Retail outlets will gradually move to new positions along the new route. This shifting of business upsets the tax structure of the community. The end result—the heavy investment in the new highway is wasted and business establishments along the new route begin to suffer because of congestion and fast-moving through traffic that is of no economic value to the abutting roadside merchant.

Second, if the new by-pass route is built to freeway standards and if convenient means are provided for potential customers to leave the new by-passed route the effect is the syphoning off of the through traffic that has no economic value and is definite encouragement to a potential customer to come into the business district.

The small city merchant still believes that there exists a definite relationship between traffic counts and business potential.

The answer has been developed through the studies of by-passed communities ranging in population from 1,500 to 6,500. This in California has developed definite and conclusive proof that the diversion of through traffic from Main Street by freeway and expressway construction is not only a stimulant to retail business activity but also has a beneficial effect upon real estate values.

FRANK C. BALFOUR: "California has proof that diverting through traffic is beneficial."

THOS. E. WILLIER: "Monetary values can be assigned to effects of the Gulf Freeway."

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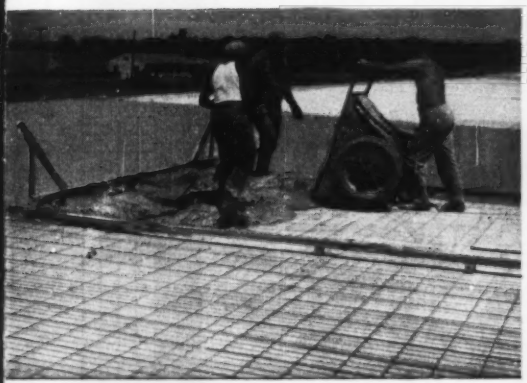

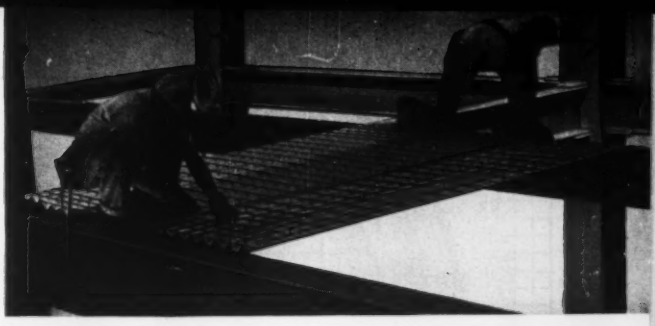

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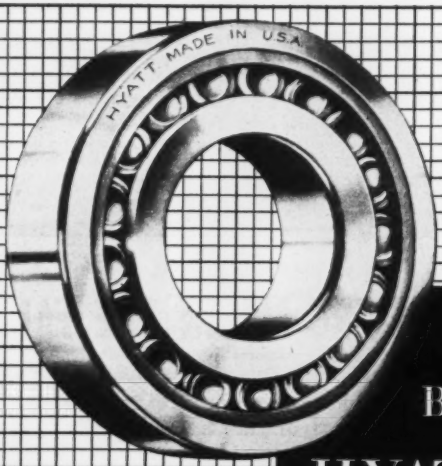
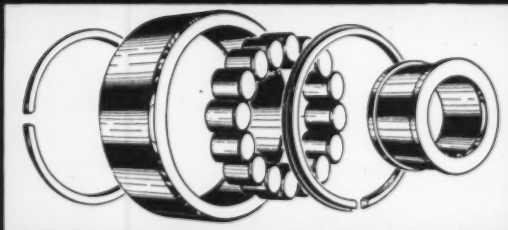


For Maximum Bearing Capacity

HYATT HY-LOADS



THERE are ten major types of Hyatt Hy-Loads—the high capacity cylindrical roller bearings for radial or light or intermittent thrust loads.

Four of the ten Hy-Loads have separable inner races, two have separable outer races and four are non-separable. Made in two diameter series, wide and narrow widths, to standard boundary dimensions, they permit wide flexibility in machine design and assembly procedures.

Typical of the Hyatt-Hy-Load line, the U-TM bearing, one of the non-separable types is illustrated and shows its full complement of rollers for maximum bearing load-carrying capacity.

And all other types, too, are just as correct in their design and equally precision-built for the kind of dependable bearing performance you expect from Hyatt equipped machines. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

PARKING DECK constructed by the Downtown Auto Park, Inc., has stimulated construction of at least one other deck by private enterprise in Minneapolis, Minn.

Getting cars off the street

- **The problem facing many cities**
- **How smaller cities have tried to solve the problem**
- **A private enterprise solution from Minneapolis**

Twenty-five years ago there were only 20 million motor vehicles in the United States. Today there are in excess of 50 million. At this time over 40 thousand communities are completely dependent on motor vehicles for all transportation needs.

In many cities, the big headache, beyond revenue and budget problems, is the problem of parking. The time has long passed when the parking problem can be left up to the individual motor vehicle owner. Today for each 10,000 persons there are more than 3,000 motor vehicles, all of them slipping into a parking spot just ahead of you.

As a result many cities have been threatened by decadence and obsolescence.

Here are some solutions to the parking problem advanced by the smaller cities:

• **By private enterprise alone**—Oakland, Cal., formed the Downtown Parking Association. This association was financed by merchants and property owners. They took leases on ground or purchased the land for parking facilities. The system has worked fairly well. A plan of validating the parking tickets for the first hours was developed.

• **Bonds backed by meters**—Riverside, Cal., is one of several cities with such a parking plan. In this case, the parking meter revenue on the streets are earmarked to acquire off-street parking facilities. As rapidly as funds were available, these facilities were acquired. The title is in the name of the city. This plan took many of the automobiles belonging to owners and employees off the streets and left the curbstone short-term parking for shoppers.

There are many cities that have tried this plan throughout the country, with variations of the plan and with varying success.

• **Assessment district plan**—The establishment of an assessment district for the purpose of making arbitrary levies against property in the district to establish off-street parking funds has been tried in a few places.

During late 1950 and early 1951, and after many months of weighing the advantages and disadvantages of city ownership and operation versus private, 32 stockholders paid in $600,000 of equity money and an insurance company loaned $1.5 million to provide funds for construction of two open-sided parking decks in the Minneapolis central loop.

One deck has 535 stalls and the other has 819.

The new corporation—Downtown Auto Park, Inc.—is operated by officers and a board of directors who draw no salaries. The stockholders are the principal loop business interests, including in their number: retailers, banks, building owners and managers, hotels, savings and loan associations and a newspaper.

Parking engineering preliminary to construction, as well as management, has been provided by National Garages, Inc., with head offices in Detroit, Mich.

• **Operation**—The corporation is now meeting its cash requirements. By the end of 1952 they hope to be showing a profit.

There is nothing as stimulating as competition.

The two decks happen to be located near the No. 1 and No. 3 retail stores. As a result, the No. 2 store is now planning to construct a parking deck.

F. E. COX: "Inadequate parking means decadence and obsolescence for cities."

LYMAN E. WAKEFIELD: "There is nothing as stimulating as competition."

SCHEDULING MEETING—Construction efficiency at giant Savannah River Project calls for careful scheduling of all work. Project and field supervisors hold various kinds of meetings at which they adjust their schedules in the light of material, equipment and manpower availability. This is a daily concrete scheduling meeting.

Problems of a Billion Dollar Contract—II

How H-bomb construction is controlled

THE SAVANNAH RIVER PROJECT

This is the second of two articles on special construction problems growing out of the sheer magnitude of Savannah River project. Over a period of several years, the Atomic Energy Commission is spending $1.2 billion on a plant that will make fissionable materials. Located in South Carolina, a few miles down the Savannah River from Augusta, Georgia, the plant is being designed and built for AEC by the Construction Department of E. I. du Pont de Nemours Co., Wilmington, Del., on a cost-plus $1-fee basis. Du Pont also will operate the plant for AEC.

In the du Pont construction offices at the Savannah River Project, one quickly senses that the bosses know what they are doing—have the operations under control. Because it is tax money that is being spent this makes for a pleasant feeling. Because more than a billion dollars is involved and a work force goal of 45,000 is rapidly being attained, such job control is remarkable. How do these managers and superintendents keep tab on things?

The answer lies in an effective system of planning, scheduling, reporting and analysis.

The system, which has evolved through many years of factory-building by du Pont's construction division, is an adaptation of manufacturing management techniques. Possessing vast experience in production, du Pont naturally has sought to apply its experience to construction.

For instance, by spending less than two hours daily in his "chart room", Field Project Manager Robert K. Mason, can know how work is going throughout the 315 square-mile reservation. He also can know whether designs are coming in fast enough, what the procurement picture is and how manpower looks. If he finds out-of-line situations, or sour spots, he has plenty of time left to get them ironed out.

Behind this concentration of reporting to the top (the "chart room" contains many kinds of readable, imaginative, up-to-the-minute graphs and charts), is an organization imbued with the philosophy of planning. du Pont thinks so much of planning that it is currently aiming a planning campaign at every man on the job. The campaign's slogan is "Plan your work. Work your plan."

• **Heart of the system**—But long before individual planning promotion began, management put "Planning and Scheduling" right up next to the top in the organizational chart. Under C. A. Parks, Jr., this department became the heart of the system that keeps everybody abreast of progress. According to Mr. Parks, his department started with a basic set of tools—procedures developed on lesser jobs—and adapted these tools to the billion-dollar project.

Here is a summary of what the plan-

ning and scheduling department does:

1. It coordinates schedules for individual construction units. These schedules aim at target dates already established. They develop on the basis of performance known to be feasible, and they involve research into the best construction methods.

2. It assembles reports on work performance.

3. It analyzes performances in relation to schedules.

4. It maintains the charts that enable the boss to be a real boss.

The system is dynamic. Schedules are revised regularly (but with an eye to the inviolable target date); a steady stream of information from the job is merged with information from the outside (design progress, procurement and labor data) and translated into realistic schedules. New planning and scheduling techniques are often tried.

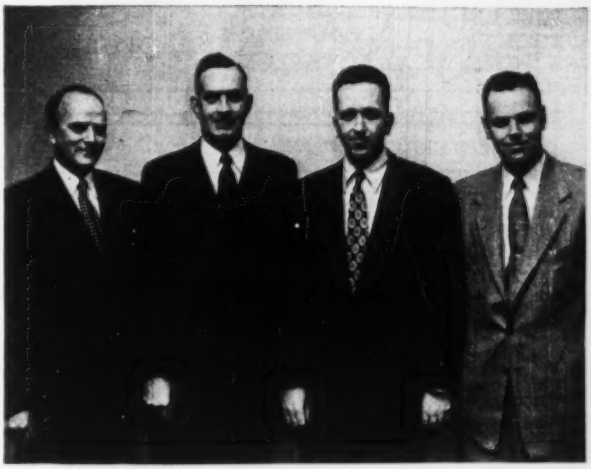
New ideas on methods are sought and compared with old. An important part of the system's dynamics is the employee suggestion plan. Always cost-conscious, du Pont says that employee suggestions so far have saved many taxpayer dollars.

• **Project analysis** – Planning and scheduling begins with the Project Analysis. There are three levels of project analysis. A formal bar-graph document, the analysis applies successively to the over-all project, to each construction area and to the building or other construction units within the areas. The top-level analysis is broken down into construction periods for the areas. The area analysis is broken down into the work-delivery sequence for the individual units, and the unit analysis is broken down into work elements, such as excavation, concrete, electrical work and so forth. While most of the project analysis work is done at du Pont's home office in Wilmington, every supervisor concerned with a unit helps make the analysis. When it is completed, each gets a copy. For each element in a construction-unit analysis there are three sub-elements: designs, procurement and work-in-place.

• **On-job scheduling**–So far, the system is similar to that for any competent construction project. But now the analysis becomes the basis for a series of three planning documents that are made on the job:

1. Monthly Work Forecast
2. Weekly Work Forecast
3. Weekly Work Schedule.

Other planning instruments supplement these three. They include a separate concrete-scheduling system, and a detailed written plan for each construction unit–called a "Construction Job Plan."



AEC and DU PONT team up to manage Savannah River Project. Left to right, these men have top assignments: Curtis A. Nelson, Manager of the Savannah River Operation Office, Atomic Energy Commission; Robert Blair, Deputy Manager, AEC; Robert K. Mason, du Pont Field Project Manager, in charge of construction; Don A. Miller, who will be du Pont's Works Manager in charge of operations.

The job of managing a billion-dollar contract

Robert K. Mason, field project manager for du Pont, says of his job:

"Supervising a 200,000-acre job, with more than 30,000 men working at different sites in scattered locations calls for special techniques.

"It is impossible for me physically to inspect the engineering and construction aspects of the operation, or to keep in constant contact with key supervisory men in the field. So a fingertip system had to be devised, to report current progress and cost trends, as well as other related data. The information must be handy, so it can be reviewed quickly at any time.

"The chart and graph group, consisting of 15 people, gathers information—progress, costs and other data on all phases of the operation—and portrays it graphically, either weekly or monthly.

"This information can be digested quickly. It allows management personnel to balance one phase of the operation against the others; to compare department-by-department progress and cost trends; and to take quick steps to remedy out-of-line situations.

"We can spot trouble before it really gets serious."

Mr. Mason says the job's top key staff numbers about 115. In the next echelon, including group leaders, supervisors and assistants, there are 250.

Construction labor supply so far has been adequate in most respects. Pipe fitters, welders, electricians and structural iron workers have been short, the welders so much so that du Pont has run welding-training schools on the job.

In name, at least, even these schedules will not be news for some good contractors. The real news is in the way the schedules work.

The monthly work forecast is made for each construction unit. It is revised weekly, the current week being dropped and a new fourth week being added. This forecast becomes a basis for acquisition of manpower, as well as for special procurement effort. Each new monthly forecast includes adjustments along the line, made in the light of newly available information.

The monthly forecast is reproduced and sent to all interested persons. One group assembles data from the forecasts to establish over-all figures on requirements (manpower, equipment, materials).

• **Weekly forecast**–The first week of the monthly forecast is broken down into enough detail, to become the basis for the weekly work forecast. Area engineers begin consulting with their aides on the weekly forecast on Tuesday of the previous week. By Wednesday morning, they have a pretty good idea what can be done the following week, so they hold an

FOR OFFICIAL USE ONLY

CONSTRUCTION JOB PLAN

Project No. _____ Area _____ Bldg. No. _____ Date _____ Page _____ of _____

Job Description _____

Starting Date _____ Prints _____

Planned by _____

STEP NO.	WHAT WILL BE DONE? SEQUENCE?	HOW WILL IT BE DONE? WHO WILL DO IT AND WHERE?	SPECIAL INSTRUCTIONS	COST CODE: BLDG NO.	COST CODE: AREA LETTER	COST CODE: COST CLASS BLOCK NO.	ESTIMATED MAN-HOURS (8 HOURS)

CONSTRUCTION JOB PLAN—A detailed written plan is made for many work units at Savannah River Project. Here is the form. Cost-code data and estimated man-days columns are filled out for a limited number of units. Later performance will be compared with the cost and time plan, to obtain a productivity analysis.

area scheduling meeting. Here, tasks are listed, crafts assigned, man-days for each task and its crafts are estimated and foremen are assigned. The result is a tentative Weekly Work Schedule.

• **Weekly work schedule**—On Wednesday afternoon, all division engineers meet with craft general superintendents to present the tentative weekly work schedule. Proposed requirements are placed on the scheduling board. Then the requirements are checked against the manpower, equipment and materials actually available.

Revisions are made to jibe the desired objectives with those really obtainable. This adjusted schedule becomes the final weekly work schedule, which is published and distributed to the field by Friday noon. From this point on, the job is in the hands of the foremen and the area superintendents.

Recently du Pont has initiated weekly-schedule conferences in conjunction with Friday afternoon safety meetings of area craft superintendents and foremen.

• **Concrete scheduling**—A key item in the materials picture is concrete. An average of 20,000 cu yd weekly goes from several central plants to a large number of individual construction units, creating the opportunity for multiple delays throughout the project. Effective scheduling of concrete deliveries therefore is of utmost importance to overall efficiency.

To attain this efficiency, du Pont makes concrete placement the subject of a separate scheduling system —and carries things a step farther than in general scheduling by holding concrete scheduling meetings every day at 1:00 p.m.

The concrete scheduling system starts with estimated concrete-requirement curves for the whole job and for each area. This helps in long-term cement and aggregate procurement. Then there are monthly and weekly concrete forecasts, as in general scheduling. The weekly forecast is made at a Wednesday afternoon meeting. This meeting must coincide with the general scheduling meeting, because the latter meeting sets up tentative concreting tasks, which form the basis for concrete forecasting. Concrete men state how much of the tentative general schedule they can comply with, and this information is pooled with other feasibility information (available men, etc.) to establish the final weekly work schedule, as well as the resulting weekly concrete forecast.

The concrete schedule is a daily document, made up the afternoon of the previous day.

The following men attend the meeting at which the daily schedule is made: Concrete general superintendent and his assistant (whole project); division engineers and assistant field superintendents from each area. These men have up-to-the-minute information on concreting performance and foremen's needs for concrete, as well as on-job compliance with the weekly work schedule. They also have the assistance of an excellent on-the-job weather forecasting service. With these data they can make a daily schedule that reduces job delays to a minimum. Schedules cover such items as the following, for a given task, or pour: The mix, the number of trucks needed, the plant the concrete is coming from; the time and rate of delivery.

The daily schedule is published immediately; by quitting time, the concrete plant foremen know their next day's task, and area foremen know how their concrete needs will be met.

• **Each area an individual contract**—Concrete is just one of the items that is administered by each area. In many ways, each assistant field superintendent and his supervisors runs an individual contracting business. These field men order their materials and they requisition labor, as specified in the weekly work schedule. They also get their equipment from a central pool and order fabricated assemblies from central shops (pipe shop, sheet metal shop, etc.).

• **Cost control**—Each field area head is responsible for control of costs within his organization. He develops target cost-performance patterns, based on du Pont experience in the types of work involved, then devises graphic means of comparing actual costs with target costs.

Service department heads have similar responsibility. For instance, groups like the plant patrol, fire department and safety department relate their costs to the number of people on the job. Area craft superintendents get unit costs by dividing unit output (of reinforcing, forms, etc.) by total labor, material, plant and overhead costs.

These supervisors may invent their own comparison methods, subject to topside approval, or they may consult with the central charts and graphs group. Always there is an interplay of ideas, so that the central group may improve its methods on the basis of field ideas. And, of course, a thread of consistency must run through the performance-reporting system so the project manager will be able to compare performances among the areas.

• **Estimating for scheduling**—Labor estimating or "estimating for scheduling" is done on a representative amount of construction work of a repetitive nature. The labor estimating program is limited to sampling activities. A representative block of work that can be completed within a period of time not to exceed 30 days is selected from a prepared schedule. A "Construction job plan" (see illustration) covering all phases of the work block is prepared and man hours are computed from du Pont standards. The job plan is distributed to all supervisory personnel concerned, and the job is conducted according to instructions in the plan.

Cost code accounts for each phase of the work are recorded by IBM machines and total man hours are obtained for the entire work block. Total man hours recorded divided into man hours estimated gives the productivity rating for the work block. Each productivity rating is studied, and low productivity ratings are investigated and corrective action s taken to bring production up to par.

Aside from its control functions, the "estimating for scheduling" program accomplishes another objective. It not only trains the field engineer for writing job plans, but also proves to him that such job plans do result in greater productivity; therefore, it encourages him to write job plans on work other than that used for control purposes. Efficiency and productivity

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L. E. Gurley, America's Oldest Engineering Instrument Maker

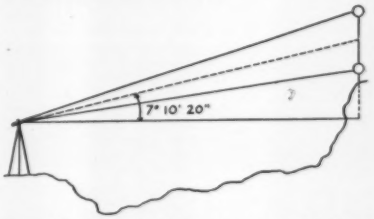
Do you use the gradienter?

"Very few field men realize the value of the gradienter," says Henry M. Stanley, Construction Engineer for The Virginian Railway Company. "But, in rough terrain, the addition of a gradienter screw to a transit can save many a headache.

"When neither tape nor ordinary stadia can do the job, the gradienter will give you a reading in a few minutes. This method was a real life saver for me when I was with the Forestry Service out through North Carolina, western Virginia, and eastern Tennessee.

"Here is how it worked near Roan Mountain, Tennessee. I placed plywood targets, 12 inches in diameter, at the 1-foot and 25-foot marks of the stadia rod on the other side of a ravine. Setting the middle crosshair on the bottom target, I found the gradienter was at 18. I then brought the middle wire to the top target, using the gradienter screw, and read 50.5 on the gradienter. The difference in reading was 32.5 units.

H. M. Stanley, Construction Engineer, Virginian Railway Company, sights with his Gurley Transit.



Using the gradienter, H. M. Stanley quickly found horizontal distance across a Tennessee ravine.

"The angle representing 1 to 100 equals 0° 34′ 22.5973″ or 2062.5973″. A unit on the gradienter is 1/100 of this, or 20.625973″.

"Using logarithms, I made the following calculations: 20.625973″ times 32.5 units equals 732.222″. The subtended interval on the rod was 24′. Therefore, 24 divided by tangent 732.222″ equals the distance to the rod, 6760.7′. The vertical angle was 7° 10′ 20″. Distance to the rod times cosine 7° 10′ 20″ equals 6707.8′—the horizontal distance.

"I have done many types of surveying in my day. Each kind requires a good instrument. On my present railroad job, my chief has just turned a new Gurley over to me. I don't believe I've ever had anything better to use."

Have you received your copy of *"The Surveyor's Notebook"* collection? It contains all the stories from the first year's series. Thousands of surveyors are finding it helpful. You will, too, for it includes many valuable tips for using your surveying instruments with greater success and pleasure. Write today for a free copy.

The gradienter screw (or Stebbinger drum) is standard with Gurley alidades. It can also be added to your present Gurley transit. Write for details.

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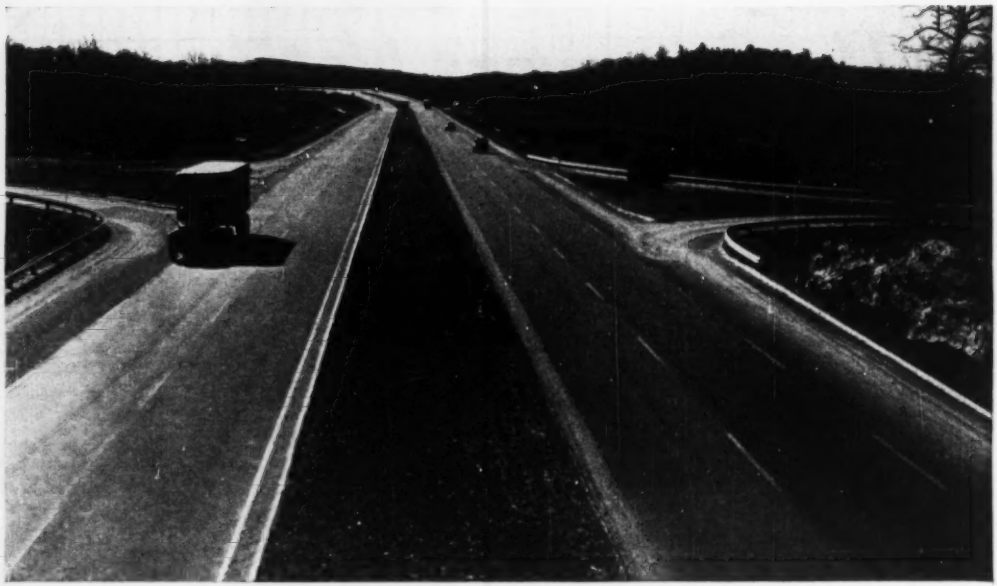


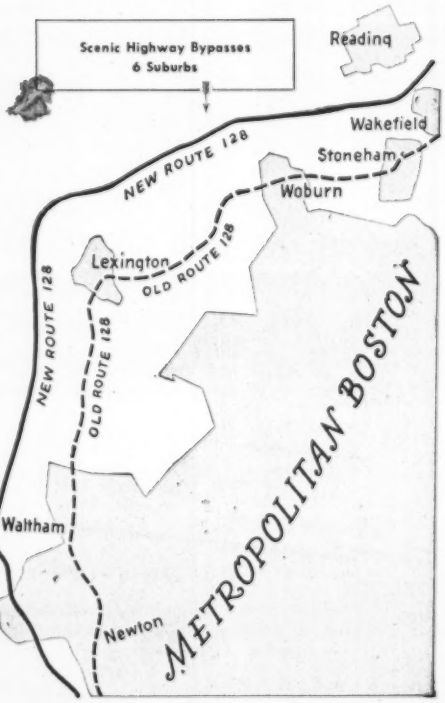
New Bypass Helps Untie Boston Area Traffic Knots

Until recently motorists trying to avoid downtown Boston's heavy traffic had to wind along old Route 128, a tortuous, 70-minute trek through six suburbs.

Using the new, 22-mile Northern Circumferential Highway, drivers can now rim the Hub in 30 minutes. More than a million cars a month travel this limited-access road, termed "the most needed expressway in all New England." The highway connects the Worcester Turnpike with the Newburyport Pike, and it will be part of an expressway from the Connecticut border to the New Hampshire line.

Flanked by paved shoulders, the two 24-foot roadways have a grassy median strip 20 feet wide. Another safety measure is the design, which permits a free flow of traffic on and off the highway. Forty-five bridges eliminate intersections and traffic lights. The State of Massachusetts maintains two patrol trucks to service automobiles in trouble.

Seven contractors completed the $18 million job. Bethlehem furnished structural steel, reinforcing steel, bar mats, dowel units and guard rails.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

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Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail • Guard Rail Posts • Wire Rope and Strand Pipe • Hollow Drill Steel • Spikes • Bolts and Nuts • Timber Bridge Hardware • Tie-Rods Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

in general for the entire project are increased.

• **Study technical magazines**—In the case of unusual or non-repetitive assignments, the "Methods Group", under the Estimating for Scheduling Section, handles the methods analysis. Men in this group keep up with current construction literature, filing any information that might apply to upcoming jobs. Faced by a specific problem, they go through their files, talk to men in the field, get information from manufacturers, even hire consultants.

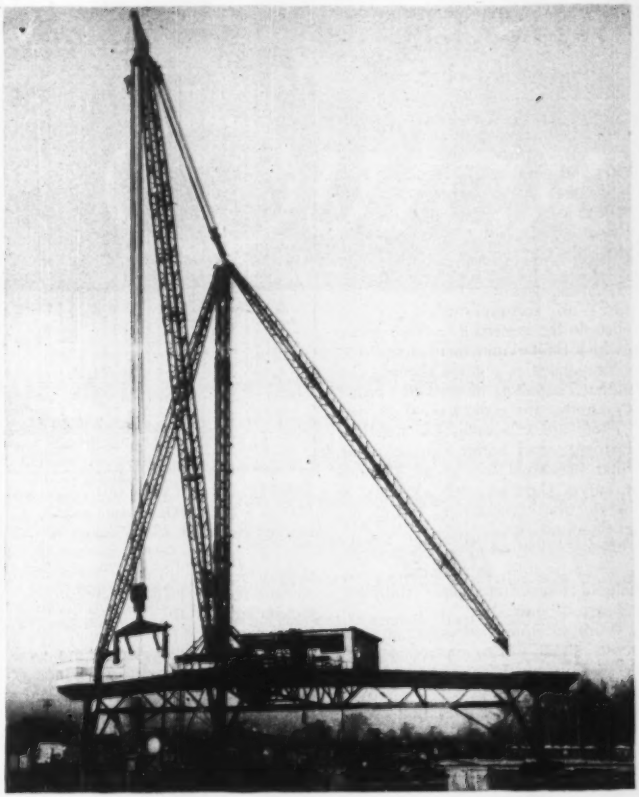
• **Select huge crane**—A recent assignment was to determine the most economical method for erecting a large number of towers in one area. In ordinary work of this sort, such as is encountered in an oil refinery, a single or double ginpole erects such towers. But here the time for moving the gin poles became a deterrent factor. It was deemed cheaper to purchase and erect a huge traveling stiffleg derrick. Analysis showed that the derrick could set five towers a day, instead of fewer than one. Moreover, labor cost per tower would be greatly reduced. Because of the number of towers, the savings more than paid for cost of the derrick.

• **Two-way radios**—Another methods-group analysis proved the economy of two-way radios in most project vehicles. Cost of the radios was weighed against the cost of extra vehicles needed if each unit had to deadhead back to its base for instructions after a mission was accomplished. The benefit from the radios is most pronounced in material-handling vehicles. However, the supervisory patrol and railroad dispatching channels are saving innumerable hours in conducting daily business with the field and the air waves.

• **Standard methods**—While the special methods group's work is spectacular, it is no more significant than that of another section, Standard Methods. This section constantly reviews the ways of doing common and repetitive construction (the employee suggestion system helps here). One result is a steady improvement of data in the du Pont "How Book"—a manual of construction procedures that many a contractor would give his right arm to have.

The other result is the most efficient construction job plan that advance-planning can create.

• **Performance analysis**—The principal purpose of the Construction Job Plan is to map out work to be done. It also is a useful tool for performance analysis—to learn whether the plan is effective, and whether estimates are accurate.



METHODS ANALYSIS revealed this crane to be cheaper than ginpoles for erecting a large number of towers. It has 200-ton capacity at 40-foot radius.

Job costs data are coded the same way as they are in the job plan, of course, so when a job is complete the costs can be pulled out (with IBM machines) and compared with the plans on which estimating was done. Procedures and sequences actually followed, as well as the number of man-days actually required for each step, are placed alongside the plan item. Thus outstanding errors can be spotted and steps can be taken to improve either field performance or job planning.

• **Field rating**—Another method of analyzing performance is the field rating. Simple in form, it is the entire assignment of another planning and scheduling section—Field Rating. This is a field evaluation of construction activity. Men with counters in each hand walk about an area counting: 1. Active men; 2. Inactive men (waiting for a truck to dump, taking a drink of water). The rating is a ratio of active men to total men counted. du Pont considers 66% to be par. Ratings are not taken in the first and last-half hours of a shift. Every area where there is construction is covered daily.

A weekly field rating report, giving five daily average ratings for each of seven construction areas, is published and distributed around the project. The data also are put on a graph in the project manager's chart room. Below-overall-average figures are printed in red to flag poor performances.

The beauty of this system is its sensitivity to change, and the rapidity with which it reveals trouble spots. The productivity report takes longer to reflect trouble.

• **Charts and graphs**—Many other reports get charted for the project manager's inspection. In all, there are likely to be 150 charts and graphs in the chart room at a time. Some are one-shot presentations—to bring out

an isolated idea or special series of ideas, perhaps for visiting top management or in response to a perplexing progress problem. Most are regular parts of the picture, kept up to date on the basis of continuous reporting.

A small section of engineers and draftsmen, in the planning and scheduling department, maintains the charts and graphs. (This section also advises area offices on effective presentation.)

Most charts and graphs relate to three subjects:

1. People who build
2. Money spent
3. Work accomplished.

People are covered by a force curve, in which total employment is reported in comparison to a curve showing the predicted numbers of workers needed to complete the project on time.

There are sub-curves for area employment and craft employment. Other personnel factors are revealed by curves showing such elements as absenteeism, termination, hiring and net manpower gain.

Money curves cover weekly payrolls, premium payrolls, departmental costs, material requisition status (number, and age of orders).

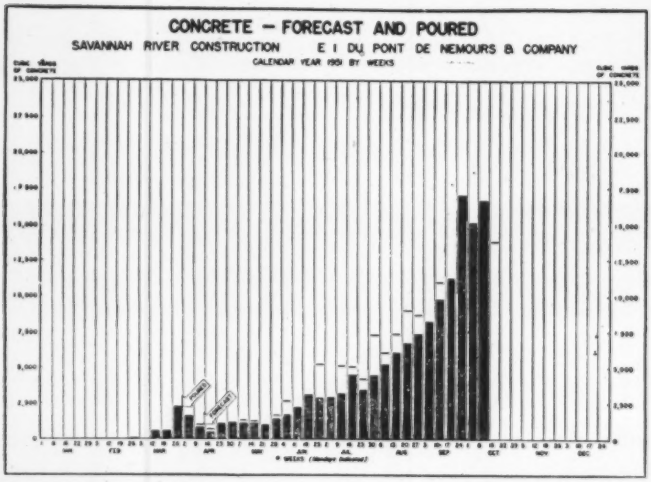
Work accomplished curves and bar graphs show design status, percent completion, cost per percent complete and field ratings.

Then there are curves that weigh combinations of the three principal subjects. One useful curve weighs financial completion as opposed to the status of and physical completion; another sets the value of physical completion against the number of man-hours worked.

Two types of comparison are used. One compares the various kinds of performance with the ideal, as determined by completion date and du Pont construction standards. The other compares performance among the areas.

But all comparisons are made to attain one objective—to keep management posted.

Many of the charts and graphs were developed on other du Pont jobs, but there is nothing static about the system. All concerned are constantly trying to improve this self-knowledge system—to make it the most efficient possible, considering the unprecedented size of the Savannah River Project.



SAMPLE GRAPH from field project manager's chart room compares weekly concrete forecast with concrete actually poured. (From Joint Committee on Defense Production hearing, November 27, 1951.)

HOW THE HOME OFFICE DOES ITS PART

In Wilmington, Del., one section of the du Pont construction division management offices devotes its entire time to the Savannah River project. A sub-section, headed by Clayton Adolph, is the very cross-road of construction progress.

Mr. Adolph's 4-man group is the one that actually makes project analyses—the bar graphs that set time goals for design and procurement as well as for construction. These analyses result from studies by many groups. Factors considered are:

1. What facilities are required, and when
2. The magnitude of the design job
3. Time-availability of progress-controlling equipment and materials (the realities of procurement)
4. The desirable and feasible construction progress

Having prepared the progress schedules for design, procurement and construction, Mr. Adolph's group becomes their watchdog.

A system of charts, many of them duplicates of Mr. Mason's charts at Savannah River, helps these men in Wilmington. The emphasis of the charts, however, is more evenly balanced among design, procurement and construction.

Using these charts, Wilmington frequently is able to foresee design-and-equipment-delivery difficulties before the field is likely to start worrying about them.

Two kinds of monthly progress reports, design progress and construction progress, are checked against over-all schedules in a continuous search for sour spots. Procurement progress is checked by what seems to be an endlessly-detailed document, the "Procurement Schedule." Beginning with a description of the item to be ordered, it schedules, by date, fifteen steps, from "Receipt of information for calculating" to "Field shipping date."

Keeping this form up on thousands of items—posting actual dates of the steps against scheduled dates—takes a lot of clerical time, but it pays off handsomely. At each step it is possible to spot a weak item. These items are summarized in a monthly report, which becomes a "tickler" for investigations by Mr. Adolph's group.

The group also acts on "SOS" calls from the field. These calls are likely to come in when the field finds it isn't getting equipment or designs as fast as it wants them.

An idea of the complexity of procurement and design production for Savannah River can be inferred from the fact that, in addition to du Pont's own design organization, six design contractors in three cities are producing the drawings. Each contractor has a set of procurement officers. Designs funnel through Wilmington to Savannah. Procurement goes through du Pont's purchasing department to the vendors. (Procurement, of course, has been vastly complicated by current material shortages and attendant government controls.)

It should be noted that the designs and orders don't actually go through Mr. Adolph's section. Moreover, the field has direct access to designers and procurement officers. It's only when the field can't get satisfaction via regular channels that it asks for special help.

But that's enough to keep four men busy.

WALLS FOR A WIDE RANGE OF SPECIFICATIONS

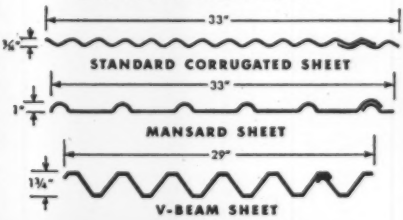
...AND ALL QUICK!

This is GALBESTOS METAL

A steel sheet to which asbestos felt is metallically bonded. Then the felt is impregnated with asphalt and waterproofed. Tested and approved by Underwriters' Laboratories, Inc., Chicago, and by Associated Factory Mutual Fire Ins. Co., of Boston. Galbestos metal comes in maroon, black or aluminum color and is fabricated in various shapes. It has been architecturally well designed into thousands of installations all over the world.

• Galbestos metal for defense plant construction provides a wall resistant to fire, corrosion and blast. It can be well designed, worthy of permanent structures. It is maintenance-free. And, whether you want a mere skin, with or without insulation or panels, the Robertson method enables you to build faster with Galbestos metal than with any other material.

Available in these forms:

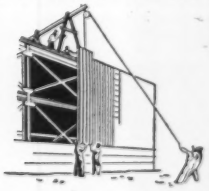


THE TOP-SPEED FASTENING METHOD

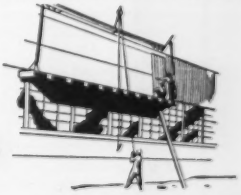
permits all fastening work from the outside, eliminates interior scaffolding. This new method permits erection crews to place twice as much material in the same time, with safety. Top-Speed Insulation is a Robertson method for applying insulation from the outside, before the Galbestos is fastened over it. This method also halves the time. It makes a good-looking job inside. Needs no painting.

WRITE FOR COMPLETE LINE OF CATALOGS

1. GALBESTOS
2. TOP SPEED FASTENING
3. Q-PANELS (STANDARD)
4. Q-PANELS (G-TYPE)



◀ Q-PANEL (STANDARD) OR Q-PANEL (G-TYPE) ▶



Q-Panels are the famous Robertson factory-fabricated, insulated curtain wall. They are available in a variety of fluted metal surfaces. Available 2' wide, in lengths up to 25', lightweight, only 3¼" thick, but superior in insulation value to a 12" masonry wall with furred plaster. A small crew can erect a Q-Panel—50 sq. feet—in 9 minutes.

G-type Q-Panels are the field-assembled insulated curtain wall: a flat interior steel sheet with insulation, and a formed Galbestos metal exterior in one of the shapes shown above. This is recommended for attractive, economical industrial jobs where insulation is required.

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World-Wide Building Service

Here's one answer to the garbage disposal problem:

Composting for profit

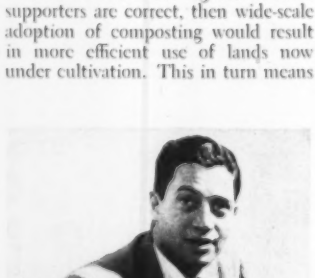
A COMMERCIAL composting operation is being carried out in Oakland, Calif., —probably the farthest advanced such venture in the United States using municipal garbage. Under development for two years, Compost Corporation of America has derived techniques, built markets and is now ready to undertake a large-scale expansion program.

At present CCA uses an average of 70 tons of mixed garbage a day out of the 350 tons collected by the Oakland Scavenger Co. So that's 70 tons less that the city-enfranchised private collector must dispose of by fill-and-cover methods.

The importance of such an operation is obvious. Suitable disposal areas for municipal garbage are becoming harder and harder to find. If composting can be developed extensively on a commercially successful scale—as the Oakland works give promise—disposal areas needed in congested neighborhoods will be sharply reduced. Already the California venture has extended the life of the existing fill-and-cover area by 20%.

Another facet of commercial composting is that it makes available for farm and garden use valuable humus material now being buried or burned. This is a theme organic garden fans have been harping on for years. It will help rejuvenate farm areas that have had the life blood drained from them by generations of use, they say. It does this by returning to the soil the humus and bacteria that keep it alive. This makes the job of chemical fertilizers—if needed—much more effective.

If the claims of the organic fertilizer supporters are correct, then wide-scale adoption of composting would result in more efficient use of lands now under cultivation. This in turn means slower expansion of the irrigated areas necessary to feed the 5,000-a-day natural population growth in the U. S.



MAKING GARBAGE PAY is Richard P. Stovroff, president of Compost Corporation of America.

• **Will it pay?**—Before accepting composting as a panacea for several ills, a close look must be taken at the dollars and cents aspect of it. The question "will it pay?" must be answered. That is, will the extra expense involved in preparing garbage for composting, in operating the compost, and in marketing the completed product give an adequate return on the investment.

Apparently officials of Compost Corporation of America think so. They have invested two years of effort, are ready to expand and are attempting to interest other operators in the know-how they have developed.

Even before CCA was established the firm's consultant, E. E. Pfeiffer claimed composting was commercially feasible in the U. S. Pfeiffer, German-born, refugee scientist, isolated bacteria strains that he claims will speed the composting process and further enrich the soil. Pfeiffer interested a young Buffalo, N. Y., waste-paper salvage executive, Richard P. Stovroff, in the work. With Stovroff getting the financing and providing the administrative talents, CCA was formed.

Oakland, Calif., was selected as the site for operations for a number of reasons. First, it is located in the heart of rich farming operations providing a ready market for the end product. Second, some existing facilities were available for use. This plus favorable climatic conditions (outdoor composting thus being possible) enabled CCA literally to start on a shoestring.

CCA is now producing 50 tons of finished compost a day. This is marketed as Com-Co organic fertilizer by the Ferry-Morse Seed Co., a leading West Coast farm and garden supplier. By the ton it sells to farmers for about $34; to home gardeners it is available for about $4 a cwt.

• **How it's done**—First step in readying the Oakland garbage for composting, is to remove the salvageable and noncompostable materials. Some existing facilities were available for this:

After cessation of ocean dumping operations some years ago, the Oakland Scavenger Co. went to fill-and-cover disposal. They also tried mechanical salvage operations followed by kiln burning (ENR May 20, 1943, p. 88). This was operated intermittently over a period of years with little success. But the facilities were ideally suited to prepare garbage for composting.

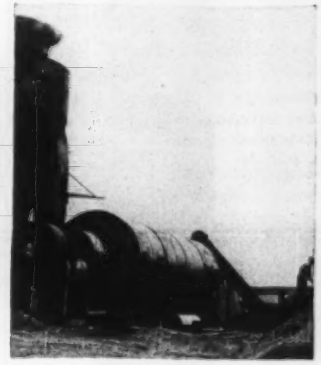
Available for use were the concrete dumping floor, a conveyor belt for sorting and the kiln. CCA added to this a rotary magnet to remove metals

RAW MATERIAL is one-fifth the refuse collected by a contractor for the city of Oakland, California.

NON-COMPOSTABLES are separated out magnetically and by hand. Getting workers was not too hard.

ADDED BACTERIA are mixed with garbage. E. E. Pfeiffer, above, isolates the desired strains.

OPEN-AIR COMPOST is turned over once in 21 days. First, it is ground and mixed with soil, manure.



DRYING KILN dries out the composted material, then pelletizing reduces it to a commercially attractive product.

FERTILIZER FOR DELIVERY passes incoming garbage as it heads out to market in 100-lb bags.

and a blower to remove most paper.

Thus, the mixed garbage is first dumped on the concrete floor. It is shoved on the elevating conveyor, passes the magnet and blower to the sorting area. Here bottles and such other noncompostables as nylon stockings are removed. The remainder goes into the compost after a little further processing.

On an open air dirt platform, soil and manure are added to the garbage. Percentages vary from 5 to 10% for soil added and from 10 to 25% of manure added.

Then the mix goes to a grinder where it is chopped into pieces averaging about 1 in. in size. But just before entering the grinder it is sprayed with Pfeiffer's bacterial spray in concentrations of one ounce of spray per ton of mix.

The spray, according to Pfeiffer, contains 32 bacteria particularly adaptable to garbage decomposition. Some of these micro-organisms, Pfeiffer says, have never been isolated and identified.

The chopped and sprayed mix is spread in rows. Under normal weather conditions it thoroughly composts in three weeks with one turning. During the process it reaches a temperature of 160 F.

Experts don't agree on just what processing is most important for good composting. All agree that chopping or grinding is necessary to insure proper aerobic decomposition.

Researchers at the University of California have composted garbage in 10 to 12 days without adding any bacteria, soil or manure. But they turned the mix daily—or least every working day. CCA takes three weeks with only one turning.

The precise function of the bacterial spray is not clear. Some observers have termed it "alchemy." Others say the soil and manure would assure relatively short term decomposition even without the spray. The fact remains that CCA's mix does compost in three weeks and is a saleable product.

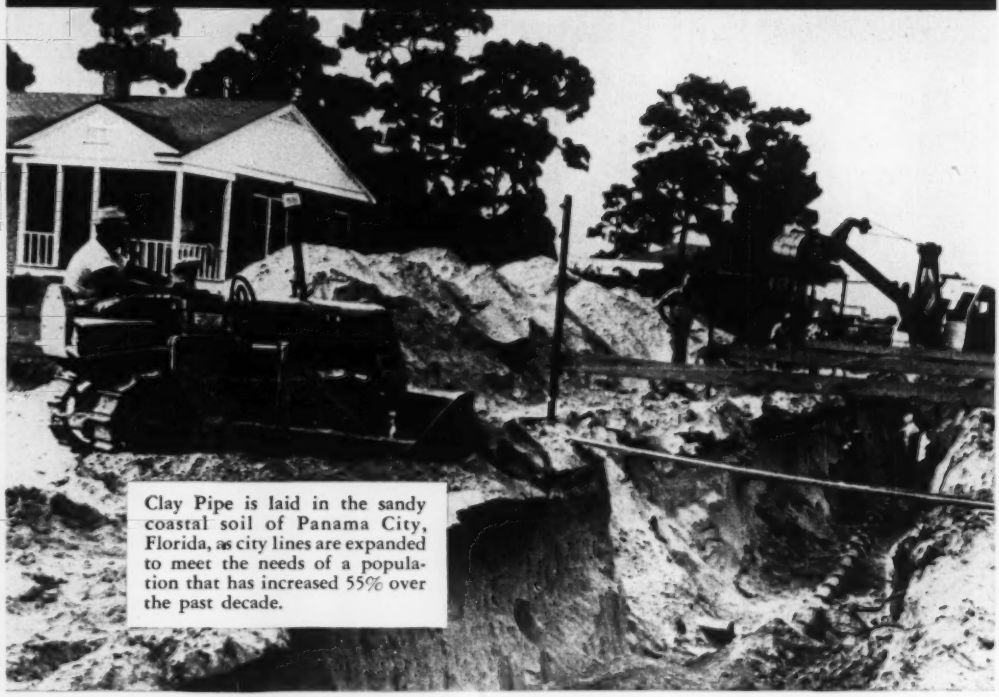
• **Dehydrated and pelletized**—Final step in the CCA process is to dehydrate the compost, pelletize it and package it for sale. The old kiln is used for dehydration but the compost is first screened. This takes out glass and metal bits not removed in the original sorting process.

Function of compost as a fertilizer is to add humus and bacteria to the soil. Nitrogen and other chemicals can be added if desired. On large orders CCA adds chemicals to the finished product before pelletizing.

So, these are the steps: (1) preparation, (2) mixing and chopping, (3) spreading and turning, and (4) dehydrating and packaging. If these steps can be carried out at less cost than the income from sales, then the venture is a commercial success.

Indications are that CCA, led by its President R. P. Stovroff, is operating at a profit in Oakland. They are ready to expand their Oakland works and will assist other firms in starting elsewhere.

CLAY PIPE—*ESSENTIAL • ECONOMICAL • EVERLASTING*



Clay Pipe is laid in the sandy coastal soil of Panama City, Florida, as city lines are expanded to meet the needs of a population that has increased 55% over the past decade.

Panama City installs 85 MILES of CLAY PIPE in $3.5 MILLION Sewer Expansion Program

More than 440,000 feet of newly-installed Vitrified Clay Pipe will serve defense housing and industry in Panama City, Florida. It's the *one* pipe that has proven its dependability and resistance to corrosion through *actual service in the ground.* In acid soils inland or alkaline coastal sand, Clay Pipe continues to provide the same unfailing sanitary service, year after year. It's chemically-inert — unaffected by sewage gases or electrolysis. *It never wears out!*

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Wherever Reliable, Performance-Proved Pipe Is Needed, Specifications Call for Vitrified Clay

Tucson, Ariz. (Air Force Base)	440,000 ft.
Rapid City, S. D. (Air Force Base)	54,000 ft.
Morrisville, Pa. (New Steel Defense Plant)	300,000 ft.
Marion, N. C. (Municipal Expansion)	32,000 ft.
Limestone, Maine (Air Force Base)	65,000 ft.
Rantoul, Ill. (Chanute Field)	158,000 ft.
Bakersfield, Calif. (Air Force Base)	196,000 ft.
Orlando, Fla. (Air Force Base)	74,000 ft.

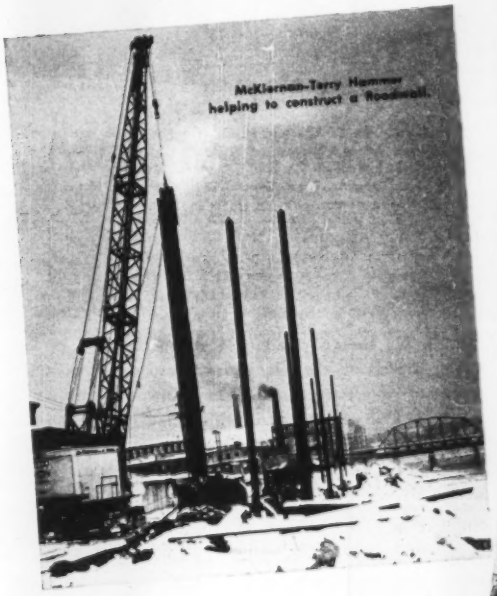
Vitrified
CLAY
CLAY PIPE NEVER WEARS OUT!
PIPE

C-652-6

McKIERNAN-TERRY PILE HAMMER

proves its versatility

FOR MASSACHUSETTS CONTRACTOR



HERE are a few of the construction projects on which Daniel O'Connell's Sons, Inc., general contractors of Holyoke, Mass., have used a powerful, dependable McKiernan-Terry Double-Acting 9-B-3 Hammer.

FOR A BUILDING

Constructed close to the Holyoke canal system, the foundation for a new building required over 200 timber piles up to 30 ft long which were driven to capacity with the McKiernan-Terry Hammer.

FOR A FLOOD WALL

The new Holyoke concrete flood walls and earth dikes required a steel sheet pile cut-off wall. The steel sheeting, up to 60 ft in length, was driven to refusal with the McKiernan-Terry 9-B-3 Hammer.

FOR A BRIDGE

A new South Hadley, Mass. highway bridge over Stony Brook has abutments which needed 110 steel bearing piles over 20 ft long. These were driven to ledge with the McKiernan-Terry Double-Acting 9-B-3 Hammer.

Contractors all over the world have proved the power, dependability and versatility of McKiernan-Terry equipment. Bulletin describes complete McKiernan-Terry line including 16 sizes of pile hammers and 2 sizes of pile extractors. Write for your copy today.

Other McKiernan-Terry Products

MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES

Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

GRAB BUCKETS

Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

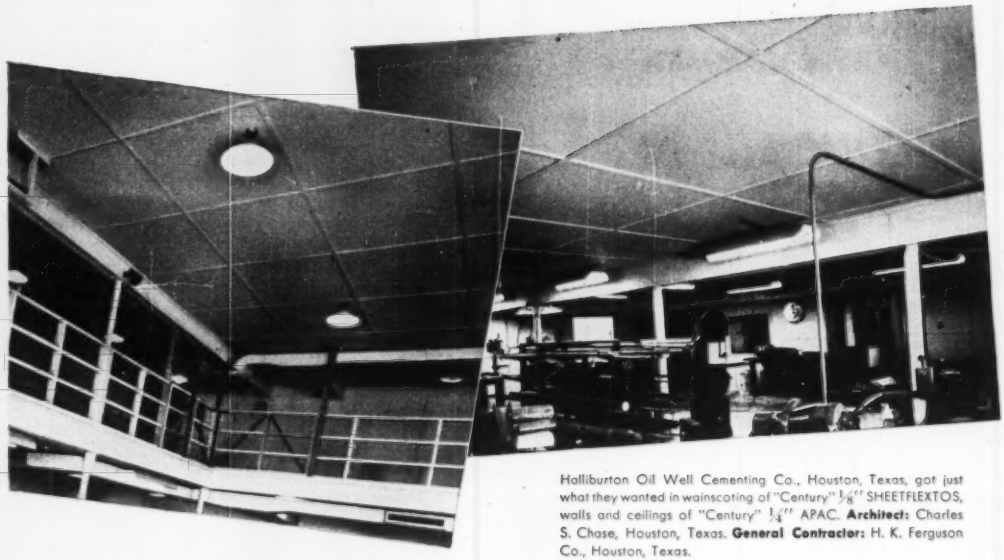
HONING UP TO 42-IN. I.D. X 55-FT. LONG

Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 38, N. Y.

Plants: Harrison, N. J. and Dover, N. J.

MK 939



Halliburton Oil Well Cementing Co., Houston, Texas, got just what they wanted in wainscoting of "Century" 1/8" SHEETFLEXTOS, walls and ceilings of "Century" 1/4" APAC. **Architect:** Charles S. Chase, Houston, Texas. **General Contractor:** H. K. Ferguson Co., Houston, Texas.

Walls without worries

... ceiling without overhead

with **"CENTURY"**

ASBESTOS-CEMENT SHEETS

Halliburton Oil Well Cementing Co. wanted strong, good-looking walls and ceilings that would be *fire-resistant* and *easy to clean*. That's why they chose "Century" SHEETFLEXTOS for wainscoting applied over solid sheathing and "Century" APAC secured right to studs and joists for upper walls and ceilings.

Fire-resistance, of course, is an outstanding feature of these structural boards, combined as they are of virtually indestructible asbestos fiber and portland cement. Ease of cleaning, too, comes "naturally" to their hard, smoothly-textured surfaces that can't be hurt by water, dampness, or rot, and need no protective painting.

But look at the *extra* features that go with "Century" APAC and SHEETFLEXTOS. Both Sheets are also resistant to rodents, immune to termites. They go on fast, in big sheets (standard 4′ x 8′) that can be cut or drilled on the job, and fastened easily with screws or ring-fettered nails. They obviate the need for laths and plaster, and, while they require no painting at all, they take decorative colors well. SHEETFLEXTOS, as its name implies, has the added advantage of flexibility, to make curves and domes where indicated.

Both "Century" APAC and "Century" SHEETFLEXTOS make good surroundings for successful work and enjoyable living. Figure on one or both for your attractive, fire-resistant interiors. Write us for further details about these economical products ... and name of your nearest distributor.

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Keasbey & Mattison has made it serve mankind since 1873

K&M last in asbestos

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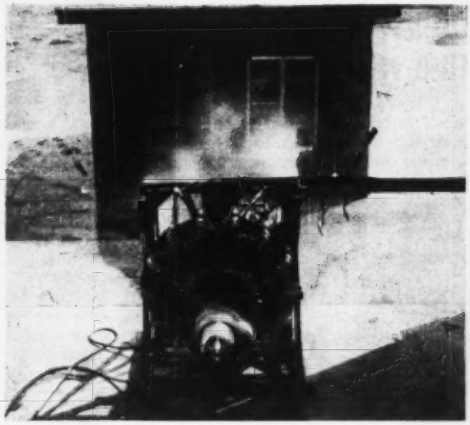


AIRPLANE ENGINE creates 140-mph blasts of turbulent air and throws 20 gpm of simulated torrential rain at test windows.

FUNNEL BEHIND WINDOW catches air coming through. trough collects water. Standard is 75 cfm (air), 0.20 gpm (water).

Man-made hurricane tests windows

"HURRICANE APPROVED!" That's the seal Florida window manufacturers now place on their products after they've passed a new and rigorous test that for the first time takes water infiltration into account. Builders in the hurricane area are assured of windows that will allow only harmless quantities of water to infiltrate, even when struck by a 100-mph wind and torrential rains.

But of greater significance is the test itself—more than four times as severe as previous standards. Its performance thus far has yielded valuable information. This, in turn, has helped window firms make design and construction improvements so the new standard of acceptability could be met.

Adaptation of the new test procedure in other high-velocity storm belts throughout the United States could mean similar benefits and assurances to builders in these areas.

• **Background**—While less spectacular than roof damage costs, losses due to infiltration of water through windows during hurricanes are almost equal in dollar volume. It was this much-ignored fact that prompted development of the new test procedure: Builders began to question the effectiveness of windows during hurricanes, glass jalousie types in particular, so members of the Florida Window Manufacturers Assn. decided to finance a study of this source of damage. They asked H. Horton Sheldon, dean of the Division of Research & Industry at the University of Miami and director of the Housing Research Laboratory, to undertake the research.

Dean Sheldon started from the then standard test in which the window was subjected to a steady air pressure of 25 mph. He felt such a test had little relation to actual hurricanes during which turbulent flows of more than 100 mph, accompanied by torrential rains, occurred.

• **How test is made**—The arrangement finally developed is shown in the accompanying pictures. A 12x12-ft flat-roof building accommodates two full-size test windows (one is a control). To stimulate hurricane conditions, a radial airplane engine, equipped with a variable-pitched propeller whose blades are 52 in. long, is used to power a blower. This equipment is positioned so the blades are 20 ft from the building.

Water is introduced behind the engine at the rate of 20 gpm. Air speeds up to 140 mph are obtained, measured with a hand Pitot tube.

Behind each window is a long metal funnel ending in a 6x6-in. opening. A sensitive anemometer at the opening measures the amount of air which comes through the window. Water that comes through is collected in the trough seen just below the cone.

A test runs for 12 min. During the first ten, air speed is maintained just above 100 mph. During the last two minutes, gust conditions of 80 to 120 mph are produced.

• **Results obtained**—The standard of acceptability decided upon after many tests is that a window is considered satisfactory if air infiltration is not more than 75 cfm and water infiltration doesn't exceed 0.20 gpm.

This may seem like a lot of air and water, but few hurricanes are ever as severe as the test. Any window that meets this standard is reasonably certain to be completely free of water infiltration during any conditions expected in the Miami area.

Awning, double-hung, casement and glass jalousie type windows have been tested. The data obtained have been used already by manufacturers.

The most significant conclusion is that the glass jalousie window, as developed in southern Florida, affords protection equal or better than that offered by any other type. A first impression is that much water and air would infiltrate through overlaps of glass louvers, but this is not the case. One louver generally overlaps the next by about half an inch and if the frame is carefully leveled on installation so there is no blending or warping, the flat glass of one louver will fit almost perfectly along the next. Capillary action will hold water between the glass overlaps and thus prevents further water or air from passing.

Infiltration that does occur is usually due to manufacturing imperfections such as (1) thickness of glass, (2) louvers being cut too short and allowing the clip (often a spring type) to ride away from the frame, and (3) bending of the top louver away from the header strip.

Extruded aluminum has been found the most satisfactory framing material for jalousie windows. Formed alu-

mium sheet is generally too light. Another important point is the design of the operating mechanism. It should act at both ends of the glass to avoid twisting the louvers and should lock down tightly.

• **Other types**—In general, windows with wood frames—casement, double-hung or awning—showed little infiltration of air and water. The wood swells quickly when wet and makes all joints tight.

Double-hung windows are not in favor in Florida since at best only half the window area can be used for free flow of air for ventilation. And during a storm, a double-hung window with outside screen is poor because much water piles up between the window and lower member of the screen frame.

Casement and awning windows suffer from the defect that a tight fit is seldom found with metal-to-metal contact. Even with careful installation some warping occurs. This is aggravated by locking devices that pull the window in tightly at one point, the tendency being to bow out in both directions from this point.

Full details of the tests and results are given in a technical bulletin by Dean Sheldon, available at nominal cost from the Housing Research Laboratory, University of Miami, Coral Gables, Fla.

Sighted leaks, plugged same; Navy patches Key West aqueduct

The 128-mile aqueduct carrying 3 mgd of water from Florida City to Key West, Fla., was losing about one gallon of every eight pumped when the Navy's Bureau of Yards and Docks began its recently completed job of finding and repairing its leaks.

Completed in 1942, the 18-in. line had begun to show signs of corrosion after 18 months of service. Deterioration was known to be chiefly electrolytic corrosion, but other minor damage physcially inflicted was found.

The Bureau of Yards and Docks contracted with the Hinchman Corp., corrosion specialists, to locate the leaks and see how effective cathodic protection along some segments of the line had been. Their survey uncovered 42 leaks. Advanced corrosion, too, was marked, as well as damaged coating no longer effectively protective.

None of the leaks was found by eye. Water leak detectors had to be used.

Rods were driven into the soil at selected 50-ft intervals. When sound readings indicated leaks, they were "zeroed in" by more closely spaced rods. Once located, leaks were marked for repair by maintenance crews.

Tests made included soil resistivity measurements and pipe-to-soil and pipe-to-water potential readings. A commercial meter for testing soil and cathodic protection was used; electric current for the tests came from a portable generator.

Hinchman Corp., on completion of its survey, recommended a regular test and maintenance program based on stations set up at intervals for check on effectiveness of cathodic protection. It further recommended complete redesign of the cathodic protection installation, which was found to be faulty in spots.

Cost per mile of installing the protection system now in place was $2,500. Total unexposed length of the aqueduct is over 108 miles. Where it is exposed, main damage to the line comes to its protective coating as the wear and tear fishermen and sightseers give it.

BuDocks engineers will study recommendations of the contractor with an eye to long-range protection of the line. Details of the corrosion survey were presented in the U. S. Navy's Civil Engineer Corps Bulletin for April, from which this information has been taken.

Shaped charges speed blast hole drilling for Army

Combat engineers in Korea are using shaped charges to punch bore holes for rock excavation.

The pictures here show a typical application. The engineer soldier readies an M-3 charge in preparation for blasting a side-hill cut for a by-pass road somewhere in Korea. The container, which looks like a milk can on three legs, is the standard container for the M-3 charge.

The shaped charge is an explosive package shaped to concentrate its explosive energy in one direction. The M-3 weighs 40 lb, including 30 lb of explosive.

In the bottom of the M-3 is a conical recess which helps to concentrate a stream of explosive energy into a jet. This jet hits near the center of the area marked by the three legs. The container is about 9 in. in diameter and 12½ in. high, mounted on three legs 15 in. long. This 15-in. distance from the surface to be penetrated helps to give the charge its concentrated power.

How far the charge will punch into rock depends on the rock formation, but an M-3 will penetrate reinforced concrete to a depth of 60 in., cutting a hole 5 in. in diameter at the opening, with an average diameter of 3½ in.

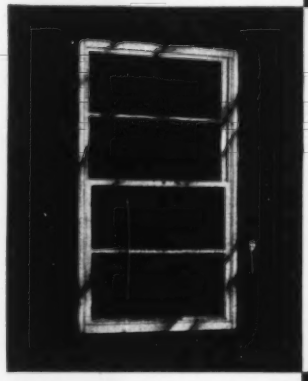
There's a new member in the family of Ceco better engineered products

We present

CECO-STERLING aluminum windows

Here is Ceco-Sterling Double-Hung Aluminum Window, Series 200-B with Hopper Vent . . . especially adaptable for hospitals and schools.

Here is Ceco-Sterling Double-Hung Aluminum Window, Series 50-B for residences.



Adding a new member to our family of building products is something we do with a great deal of thought here at Ceco. Thought of you . . . the architect, engineer, contractor, builder, dealer and of course the owner, too.

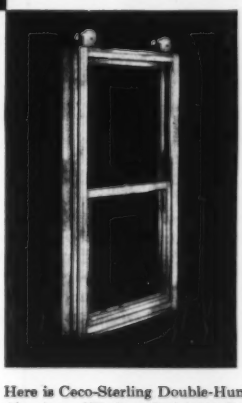
So painstaking research guided us in deciding on the new member of our family. Today we offer you Ceco-Sterling Double-Hung Aluminum Windows because you've stated your preference for such a product. And since there was immediacy in your desire we acquired a product already in manufacture . . . the Sterling Aluminum Window . . . a leader in the field since 1937.

Here's a window built for permanence . . . made to outlast any structure . . . handsome and then some . . . with clean graceful lines . . . slender muntins allowing a generous glass area letting in more light . . . more view.

When you specify Ceco-Sterling Aluminum Windows you know you specify the very best . . . you're sure of savings, too.

Here are 9 reasons you'll prefer Ceco-Sterling Aluminum Windows

1. Made of ageless aluminum — won't rot, rust, rattle, stick, warp or swell
2. All climate, weather-tight seal; completely weather stripped
3. Easy to install—simplified anchorage
4. No painting necessary—minimum maintenance
5. Wipe-easy cleaning
6. Rigid, rugged long-life construction
7. Feather-light, friction-free, raised or lowered with finger tip
8. Smart styling—with a look of the future
9. They last and last—offer long haul low cost



Here is Ceco-Sterling Double-Hung Aluminum Window, Series 200-B, used in commercial, monumental, office, and industrial buildings . . . also popular for hospitals and schools.

CECO STEEL PRODUCTS CORPORATION

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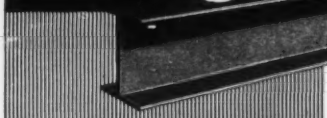
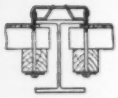
In construction products **CECO ENGINEERING** *makes the big difference*

SUPERIOR ACCESSORIES ON THE BEAM



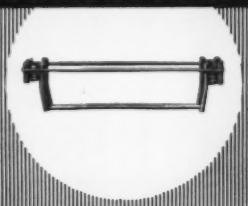
Designed to meet field conditions on BRIDGE SUPERSTRUCTURES, these three types of Hangers provide efficient means for hanging forms from steel beams and girders, not fireproofed.

STANDARD COIL HANGER FRAME

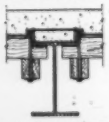


When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½″ coil bolts, and flat washers. Total safe load on both bolts is 4,500 lbs., or 2,250 lbs. per bolt.

SPECIAL COIL HANGER FRAME



AT LOW HAUNCH



AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to efficiently meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½″ Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½″ bolt.

COIL BEAM SADDLE

Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½″ Coil Bolt. Coil Beam Saddles are also furnished for ¾″ and 1″ bolts.

NOTE: WORKING PARTS (Bolts and Washers) are returnable. Layouts and estimates for Superior Hangers are available without cost or obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

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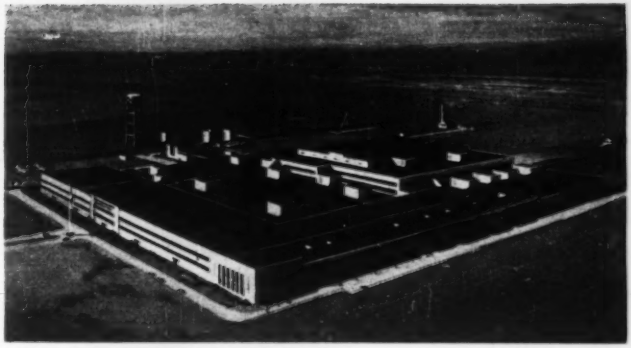
Request a copy of our **NEW CATALOG 500**

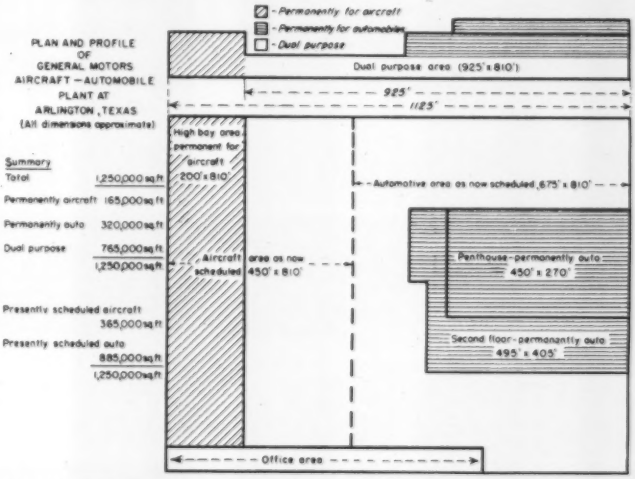
Dual-function plant features convertability



CARS AND PLANES will be produced simultaneously in General Motors' new plant now under construction at Arlington, Tex. Architect's rendering is shown.

A REMARKABLE DEGREE of production flexibility has been designed into General Motors' $18 million combination auto-airplane plant, now under construction at Arlington, Texas. Of a total 1,250,000 sq ft, 765,000 are designated as a dual-function area that can be converted from automobile to aircraft production, or vice versa, in a matter of days.

Upon completion, one part of the plant will assemble Buick, Oldsmobile and Pontiac cars, the other Grumman-designed airplanes for the Navy. In the event of need, the 320,000 sq ft permanently assigned to car output (which contains all the specialized machinery) will be used as storage space. Conversely, if peace were on the horizon, the 165,000 sq ft assigned permanently to aircraft will be utilized in the same manner (see drawing).


- Permanently for aircraft
- Permanently for automobiles
- Dual purpose
PLAN AND PROFILE OF GENERAL MOTORS AIRCRAFT—AUTOMOBILE PLANT AT ARLINGTON, TEXAS
(All dimensions approximate)
Dual purpose area (925' x 810')
925'
1125'
High bay area permanent for aircraft 200' x 810'
Automotive area as now scheduled 675' x 810'
Summary
Total 1,250,000 sq ft
Permanently aircraft 165,000 sq ft
Permanently auto 320,000 sq ft
Dual purpose 765,000 sq ft
1,250,000 sq ft
Aircraft area as now scheduled 450' x 810'
Penthouse - permanently auto 450' x 270'
Presently scheduled aircraft 365,000 sq ft
Presently scheduled auto 885,000 sq ft
1,250,000 sq ft
Second floor - permanently auto 495' x 405'
Office area

KEY TO FLEXIBILITY is dual-purpose area which can be changed from peacetime to wartime work in a matter of days.

• **Some disadvantages**—While such an arrangement means idle space during either of the all-out phases, this condition is one of the basic facts of life where a dual-function plant is concerned. For both car and plane production, a certain portion of the assembly area must be of special design and contain permanent equipment unsuitable for production of the other. It follows that these one-purpose areas should also be used for storage when not being used productively.

Of course, there won't be any idle capacity as long as the presently contemplated dual production continues. And GM people figure the current guns and butter policy to be a long-term affair.

But still some sacrifice in use of space must be made. A good deal of extra room for shifting about must be allowed. In terms of auto production, 35 cars per hour can be assembled if the maximum 1,085,000 sq ft were utilized. At a standard B-O-P assembly plant in Atlanta, Ga., 47 cars per hour can be produced in only 1,000,000 sq ft.

These disadvantages, while appreciable, do not begin to match the overall savings in time and money that this dual-function plant will yield to General Motors and the government (which in the last analysis pays for expensive conversions of peacetime facilities and urgent construction of new wartime plants with their fast depreciation rates). In addition, government feels the safety of the nation is bulwarked by a plant that can be ready for any sudden influx of military orders far in advance of the time raw materials begin to arrive.

• **Large bays**—The building itself is a steel-framed structure. All of the dual-function and permanent automotive bays are 45x45 ft and 20 ft high. All of the permanent aircraft bays are 35 ft high. Some are 45x45 ft, others are 45x90 ft and 90x90ft. The second floor, where the specialized auto equipment is located, is 17 ft high.

Conveyor belts in the automotive sections will be in channel pits in the floor. Therefore, if the first floor automobile space were needed for aircraft output, a smooth base is available immediately for installation of other production lines.

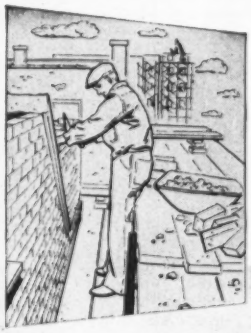
A 60,000-kva line will bring power to a master substation, then to roof transformers where current will be stepped down by customary stages to the 440-v requirements of either manufacturing phase. Employee facilities will be centrally located and readily accessible during any production schedule.

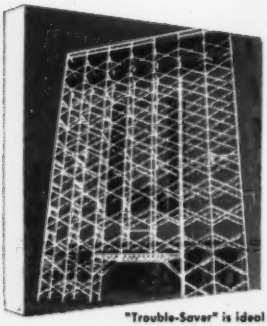
GM's Argonaut Realty Division is the architect and engineer. Thomas S. Byrne, Inc. of Fort Worth, Texas is general contractor. The plant will be completed a little less than year from now.

Speeds Work . . . Lowers Costs

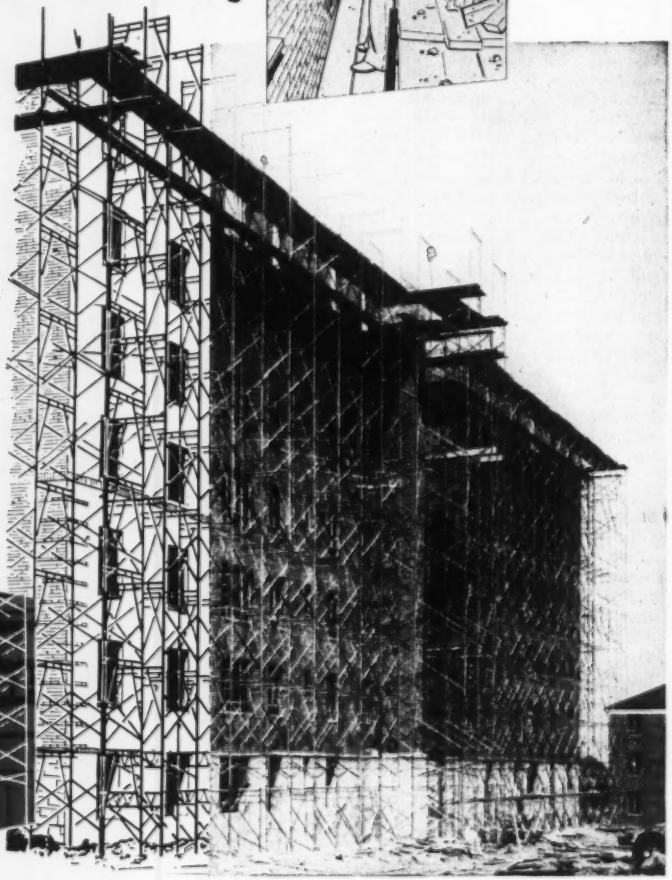
"TROUBLE-SAVER"

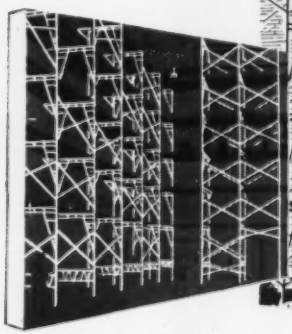
Sectional Steel Scaffolding





"Trouble-Saver" is ideal for repairs, refacing.





Typical interior installation for lathing, plastering, painting.

Listed by Underwriters' Laboratories, Inc.

RENTALS—SALES

You can rent or buy "Trouble-Saver" Scaffolds, whichever best suits your needs.

GET THESE FACTS! — Write today for free Bulletin PSS-24. It shows how "Trouble-Saver" can help you cut scaffolding costs. Contains photos and detailed sketches showing how contractors use "Trouble-Saver" to cut costs with safety.

● This is only *one of many* types of scaffolds we make for every possible need. Fully *coped and welded* frames, full *double diagonal* bracing give greatest safety and rigidity. Yet no tools are required. Easy-to-erect "Trouble Saver" helps you cut scaffolding costs to a minimum. Listed by Underwriters' Laboratories, Inc.

Remember this: We make *all* types of modern scaffolds. That's a convenience *no other supplier* can offer you. Our stocks of scaffolding, spotted in major cities from coast to coast, are the largest and most complete. *One* source for every type scaffold!

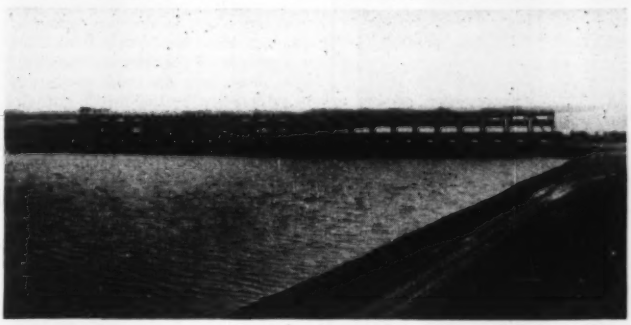
Whatever your job . . . we can scaffold it for you—with the RIGHT *scaffold!*

GOLD MEDAL LADDERS SCAFFOLDING

for Greater Safety...Efficiency...Economy

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. ENR, Long Island City 1, N. Y.
West Coast Plant: 6931 Stanford Ave., Los Angeles 1, Calif.



WARRAR INLET REGULATOR—Containing 24 gated openings, it can pass flows up to 115,000 cfs.

Iraq makes rapid progress on vast public works plan

Since a development board was set up in 1950 by the government of Iraq to outline a plan for raising the living standards of the country, several projects have been started, and the organization and money are now available for continuing and increasing progress. The most recent development, in March, was the earmarking of 70% of the country's oil royalties for the use of the board.

• **Millions earmarked**—The estimated total amount available from this source, over the six-year program now set up, is about $435 million. Included in this is $149 million for irrigation; $75 million for roads and bridges; $50 million for buildings; $87 million for industrial and mining schemes; and $64 million for miscellaneous works such as airfields, marsh draining, wells and mountain resorts.

The amounts for public works budgeted by parliament for each fiscal year, beginning April 1, are:

1951	$27 million
1952	57 million
1953	79 million
1954	88 million
1955	91 million
1956	93 million

As a comparison the total prewar budget for the country was about $28 million annually.

• **Participation from America**—The irrigation expert on the 8-man development board, headed by the country's Prime Minister, is Wesley R. Nelson, former assistant commissioner of the U. S. Bureau of Reclamation. Mr. Nelson went to Iraq last March under the U. S. State Department's Point 4 program. Other U. S. participation in the Iraqu work appears in a loan of $12.8 million made by the World Bank (in which the U. S. has a 48% interest) to defray part of the cost of the Tharthar flood relief project on the Tigris River north of Bagdad.

In addition to this governmental participation, two U. S. consulting firms have been engaged by the Development Board.

Knappen, Tippetts, Abbett and McCarthy of New York was commissioned last fall (ENR March 6, 1952) to submit a comprehensive report on the utilitization of the waters of the Tigris and Euphrates rivers. The field work on this will soon be completed. In the meantime the same firm has been entrusted (late May 1952) with the investigations and preparation of all contract documents for the improvement of irrigation (a) in the vast region of Hillah (middle Euphrates), and (b) in the marshy districts of the delta of the lower Euphrates.

The second U. S. consultant is the Harza Engineering Co., Chicago, which was engaged in late May, 1952, to make investigations, prepare maps and contract documents and supervise construction of Bekhme Dam on the Greater Zab River. Cost of dam is estimated at $25 million.

• **Two projects under way**—In addition to this work, which is now in the planning stage, two projects for flood control and irrigation are actively under way. Both have been discussed for 40 years, and one of them, the Lake Habbaniyah project on the

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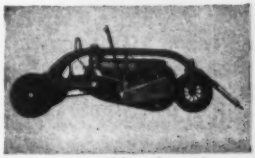

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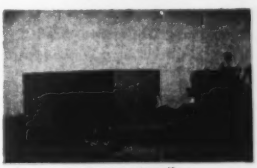

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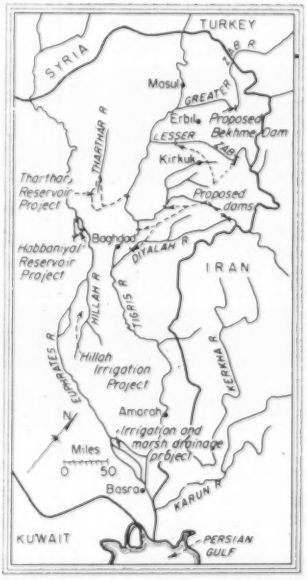
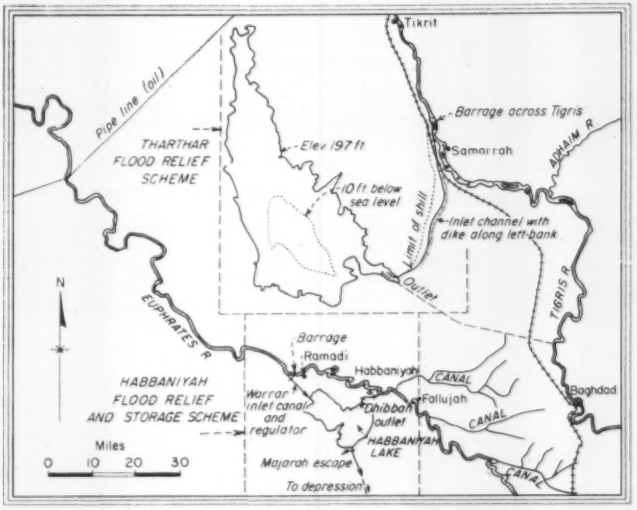
Euphrates, was started before the war. The other, the Tharthar project on the Tigris, got under way about a year ago when the World Bank loan was granted. The design and construction supervision on these projects is being handled by the British consulting firm of Cooke, Vaughn-Lee, Frank and Gwyther, London. The completed projects will alleviate flood danger in the Tigris and Euphrates vallleys and insure increased land cultivation.

• **Habbaniyah projects**—The idea for using Lake Habbaniyah as a flood relief reservoir for the Euphrates River and to store water for irrigation was first proposed in 1908, and a small amount of work was done before World War I. However, it was not until 1941 that the first of several facilities was completed. This was the Majarah outlet regulator (see map) which permitted flood waters to escape from the lake into a dry depression in the desert under controlled discharges up to 55,000 cfs.

Since the war, two other means of control for the lake waters have been added. In 1950 the Dhibban outlet channel and headworks were completed to permit the return of up to



SOME OF THE WATER PROJECTS planned to be built by Iraq with oil royalty revenues. Other large sums are earmarked for roads, bridges, buildings and industrial developments.



TO PROTECT BAGHDAD two flood relief projects are under way for Tigris and Euphrates river waters. Both utilize desert depressions as reservoirs.

7,000 cfs to the Euphrates for summer crops when the river supplies were deficient. Then in January, 1952 the Warrar inlet channel and headworks were completed which could regulate the flow of floodwaters into the lake from the river.

The final Habbaniyah facility is the Ramadi barrage across the Euphrates, contract for which was let to a group of French contractors last March for $3.9 million. This dam will permit filling Lake Habbaniyah at any time. It includes a navigation lock and fish ladder and is scheduled for completion in 1955.

• **The Tharthar project** – Since peak flows of the Tigris at Baghdad frequently exceed the 250,000 cfs capacity of the stream at that point, excess water had to be by-passed east of the city, with enormous risk, through deliberately made breaches. The Tharthar flood relief project aims at diverting all excess water of the Tigris into a natural depression 10 ft below sea level (see map). About 55 million acre-feet of water can be absorbed by the depression up to elevation 197 ft. At this level 780 sq miles will be under water. Evaporation and other losses are counted on to maintain the lake at a low level so that it can take emergency flood flows of the river.

The utilization of this depression for the protection of the Tigris valley, like that of Lake Habbaniyah for the Euphrates, was first proposed in 1908. The scheme now contemplated includes: (a) an inlet channel (see map) connecting the river to the depression, (b) a natural spill over open country for excess flood water, and (c) a high level levee along the eastern bank of the inlet channel for the protection of the country east and south of the spill.

Earth moving for this work, involving 45 million cu yd, has already started with machinery made available through the World Bank loan. Now plans are actively under way for the second phase of the project which will include (a) a barrage across the Tigris river, (b) an escape regulator for the inlet channel, (c) an under-sluice and (d) a half mile road and rail viaduct over the inlet and spill channels. The Tharthar works are scheduled for completion by 1957.

International Briefs . . .

• **Colombian dam**—Winston Brothers and Raymond Concrete Pile Co. have recently completed a $4-million dam on the Neusa River about 30 miles north of Bogota, Colombia, the main purpose of which is the regulation of the waters of the Bogota River for irrigation and flood control and for hydro-electric power for the city of Bogota.

• **Havana waterworks**—Work is about to begin on a $9-million reconstruction of the waterworks in Havana, Cuba. A 24-hour labor shift will be used to push the work to solve the

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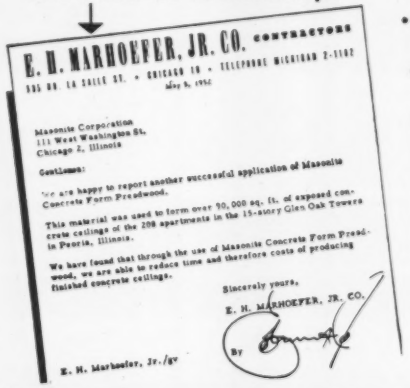

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• **Japanese power projects**—Although Japan is today generating 6 million kw of hydro-electric and 3 million kw of thermo-electric power, a further 3 million kw needs to be generated from hydro-electric sources for industrial use. The country's water power potential is put at 12 million kw. There are two big generating sources—the Dodamigawa and Tenryu rivers. The Central Japan Electric Power Co. recently has arranged for an American firm of consulting engineers to survey the Sakuma Dam on the Tenryu, where the generating capacity is estimated at 300,000 kw.

• **Yugoslavian development**—The $28 million which Yugoslavia has received as the first installment of a loan from the International Bank will be used to buy equipment for 45 factories, collieries and industrial projects.

U. S. steps up imports of Canadian copper

Refined copper imports from Canada will be stepped up one-third during the next four years. The stepper-upper: a contract signed this week between the Defense Materials Procurement Agency and Campbell Chibougamu Mines, Ltd. of Montreal, under which the company will sell 63.2 million lbs of copper in the United States by the end of 1956 at 24.5 cents a lb, or prevailing market prices—whichever is higher. (Current quotations waver between 32.7 cents and 36.5 cents.)

The U. S. government will have first crack at the copper. Campbell Chibougamau is then required to offer the remaining metal to U. S. industry. If private manufacturers don't bite, then the government will take up the copper. This is DMPA's 12th copper procurement contract, the second with a Canadian producer. (The other: Falconbridge Nickel Mines Ltd., for 25 million lbs.)

In 1951, Canada shipped only 28,000 tons of the 238,000 tons of foreign refined copper imported into the United States.

Campbell Chibougamau was incorporated in 1950, in Canada, as an exploration outfit, and has since been developing copper facilities on Merrill Island in Quebec Province's Dore Lake. E. O. D. Campbell of New York City is president. The company is building a concentrating mill with daily capacity of at least 2,000 tons. Production will begin within 2½ years.

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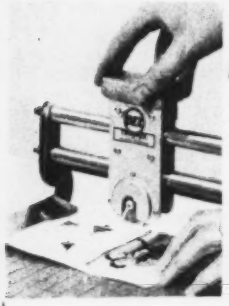

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Construction company agreement void as NLRB halts use of hiring hall

Union hiring halls used by the construction industry to keep labor forces up to par cannot have the formality of a union contract provision. That lesson was restated in last week's National Labor Relations Board decision involving the F. H. McGraw Co. (ENR June 19, 1952 p.32).

This has been the law of the land since the Taft-Hartley Act of 1947 banned the closed shop, and forbade preferential hiring of union members.

But contractors and construction trades unions since have had area-wide contracts requiring hiring of workers only through the local union office—unless the union could not fill the requests within say, 48 hours.

This was the case in the McGraw suit. Local 181 of the International Union of Operating Engineers, AFL, had an agreement with contractors in the Paducah, Ky., area requiring the use of the hiring hall. McGraw, when it got the job to build the Paducah atomic energy project was compelled to abide by the area-wide agreement, as well as with McGraw's own national contract with the international.

• **Objection**—A job applicant at Paducah, who was not a member of Local 181, complained to the NLRB that he was being deprived of employment in violation of the Taft-Hartley Act. He charged he could not get a job because the local union would not clear his name to the company.

• **Sustained**—The NLRB, in a four-to-one decision, ruled that the arrangement between McGraw and the union was illegal, and McGraw and the union were to cease operating under such a contract.

This is how the agreement operated: McGraw listed all job vacancies with the local union and asked for applicants. The local then sent the number of men requested and if qualified by experience, they were hired by the company. The men were rated in order of preference by the union as (1) membership in the local, (2) membership in another local of the international union and (3) nonmembers and members of other locals of the parent IUOE could be cleared if they paid a permit fee. All jobs at Paducah within the craft jurisdiction of the union were filled by the local for eight months.

CLIFFORD S. STRIKE, President F. H. McGraw Co., whose company must give up its agreements concerning exclusive union hiring.

• **And why**—An agreement giving preference to union members violates the law just as much as if a contract restricts hiring exclusively to union members, said the board.

Very much the same ruling has been stated in previous cases involving construction companies. The McGraw case is unique, though, because the NLRB extended its ruling to cover any and all construction projects in which the company participates. Though it had no direct evidence that the Paducah technique was used on all jobs, the board nevertheless stopped preferential hiring in the contract with the international.

From the history of similar cases, it's a good guess that the custom will continue—but only by unwritten understanding. Reason: The union headquarters often is the only place a contractor can get experienced workers. One expert reasoned it this way: "A company can't get workers out of a cow barn. But if a contractor includes the hiring preference in his contract, a disgruntled applicant has all the proof he needs to support his claim."

Efforts in Congress to write a legal hiring hall scheme, while keeping the ban on the closed shop, have made no progress—and none is expected this year.

WSB charges overpayments in Denver and Memphis

A third Denver construction contractor has been charged with paying above-ceiling wage rates by a Wage Stabilization Board enforcement commission. Latest case is that of Claude O. Wright & Co., charged with paying lathers, plasterers and hodcarriers as much as 50¢ per hour above legal maximums.

The charge covers the period from July, 1951, through May of this year. In that time, the WSB commission says, Wright paid excess wages of $16,000. Total unauthorized wage payments—the full payroll including excess wages—were almost $200,000.

Under WSB enforcement policies, the commission can disallow the total $200,000 wage payments as an income tax deduction—not merely the $16,000 allegedly paid in illegal increases. WSB says "the amount of alleged illegal wages paid is the largest disclosed thus far in Colorado, Utah, Wyoming and New Mexico."

• **Previous cases cited**—There were two previous cases of alleged WSB violations involving contractors in the Denver region. Last month, a case was filed against Malcolm A. Mackay, a lathing and plastering contractor. He was charged with paying $3.75 an hour to lather foremen, when the legal rate was $3.25. In April, the Denver enforcement commission assessed a penalty of $4,618 against the Burns Construction Co. for paying unauthorized wages (ENR Apr. 24, p. 32).

• **Investigation in Memphis**—Denver wasn't the only spot where contractors were in trouble with wage board rules.

Dr. Paul E. Bryan, of Atlanta, Georgia, regional vice chairman of the Wage Stabilization Board, reported widespread overpayment of bricklayers in the Memphis, Tennessee area, after a day and a half of investigation.

But George Wible, president of the Memphis Chapter of the Associated General Contractors, declared that so far as AGC members are concerned, he just didn't believe the Bryan report.

"We found some specific violations where bricklayers are being pair $3.50 an hour, instead of the permitted $3 an hour," Bryan said. "Reports are that the practice is quite general. Some violations are freely admitted."

In reply, Wible said, "I have no knowledge of any job by a member of the association where the rate is being exceeded."

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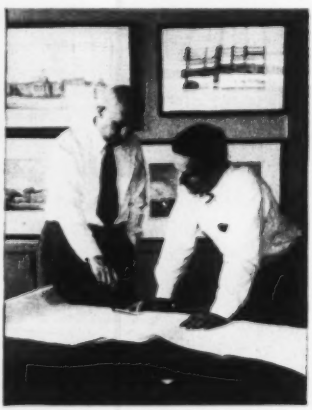
MEN AND JOBS

COORDINATION AT WORK—The division heads at a conference. (Left to right) Carl Peterson, construction manager; John P. Riley, coordinator; Bernard McLoughlin, office manager; William Correale, chief engineer. (ENR photos by Compton)



DESIGN DIVISION Chief Architect M. Radoslovich (right) confers with Riley.

RILEY believes in line organization for construction rather than staff set-ups.

Architects honor civil engineer co-ordinator of N.Y. school building

When the American Institute of Architects gave one of its two honorary memberships this year to John P. Riley June 24, after a ceremony at Lever House in New York City, it accomplished two things:

First, it took a long step in its avowed direction of bringing about a closer relationship between engineers and architects.

Second, it honored a man who brought order to a situation which had worried both professions in New York City.

Unfavorable publicity had clouded New York City's Board of Education. Stories printed in the newspapers had been widely circulated. Many rumors of waste and inefficiency had brought on a series of investigations.

Culminating the investigations—among them that of the Moore committee—was a request from all interested parties that a technical man and trained administrator overhaul the Bureau of Design and Construction of the Board of Education.

Riley agreed to accept the position

of Coordinator of Construction under certain conditions.

The first condition was that he not be permanently transferred to the Board of Education ("I had to be a free agent"). The second was that he be unhampered in his administrative capacity. With these and some other conditions agreed to, Riley was ready to begin.

• **What he found**—Design was carried on by separate offices, each handling its own particular field, but with no one assigned to schedule the work for expeditious and efficient integration and to drive it on schedule.

Construction was handled as a stepchild. No attempt was made to integrate it with design. Inspection was handled by separate offices, with almost every trade assigned separate inspectors, but with no one to integrate or coordinate the work. Administrative procedure was archaic. "There is still no central file," says Riley.

As a result of this confusion the morale of the department and the contractors who did business with them was very low. "Jobs," say Riley, "took too long, and went at the pace of the slowest contractor."

• **What he did**—Riley first determined that he would set up "line organizations" with clear lines of authority and fundamental levels of responsibility.

The two basic functions of the division—design and construction—were set up as main divisions. Within these divisions the line of responsibility was clear—bureau to division to sections. Between the two he set up service organizations.

All control of construction, including inspection was centered in the new construction division.

The design division was organized on a more realistic and efficient basis.

"We reorganized with the thought in mind that building is an industry where there must be a continuous integrated process from plan to turning of the key in a completed building," Riley says.

Riley is very happy about the cooperation and backing he got from the Board of Estimate.

• **Result**—"As a result, at this stage of reorganization, we have doubled our output of schools without increasing the number of people working for us," Riley says. "We found," he continued, "many good people in the organization. In fact the problem was never personnel, but organization: giv-

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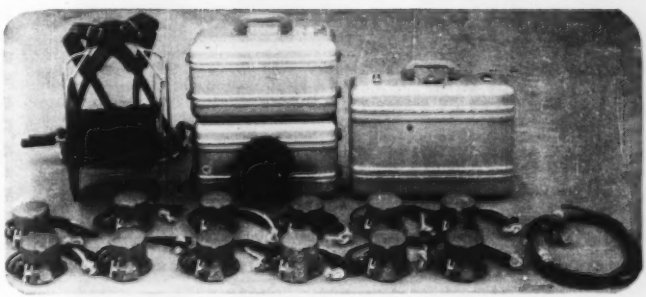

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ing the personnel a chance to do what they were capable of doing."

Spending a $50-million budget is a big business, Riley pointed out, and it should be on a business-like basis.

● **The future**—John Riley doesn't think the job is done yet. Among his recent achievements was the upping of salaries for personnel of the Bureau. He believes that capable people should be paid more attractive salaries.

Another accomplishment was getting freedom for the bureau to change or revise contracts without a pre-audit. "Too many contract changes have hung around for years without anyone daring to take the responsibility of a decision," he says.

And finally, he wants to get back the trust of contractors—the good-will—without which no building operation can be successful.

The steps up . . .

Born in Bellows Falls, Vt., in 1900, John P. Riley graduated a civil engineer from Cornell University 22 years later. Following work as a progress engineer on hydro-electric developments in New York and Pennsylvania and paper mill developments in Quebec, he was named Assistant Deputy Administrator for the National Recovery Administration. In 1935, Riley became Assistant Regional Director in New Haven, Conn., for the Resettlement Administration where he supervised construction of resettlement projects in 11 northeastern states. He later served as field engineer on the original studies and survey for the Pennsylvania Turnpike and in 1938 was Superintendent of the Department of Housing and Buildings for the Borough of Queens. In 1939, Riley joined the New York City Housing Authority, becoming Director of Development six years later. He was twice granted one year's leave of absence by the authority to take over as Coordinator of School Construction for New York City's Board of Education.

Interior's highest award goes to engineer

At the closing of his Bonny Dam dedication banquet address at Burlington, Col., last month, Commissioner of Reclamation Michael W. Straus made a surprise presentation of a gold medal and a certificate for a distinguished service award to R. J. Walter, Jr., Grand Island, Neb. Walter was construction engineer at Cedar Bluff Dam, Ellis, Kan.

OBITUARIES

Charles S. Duke, 73, civil engineer for 50 years, died June 12, at Rochester, Minn. He had been a consulting engineer in Chicago. Formerly he had been with the Chicago city bridge department, and on federal housing work in the Virgin Islands and in Cuba.

George D. Neville, project manager for the McGraw Construction Co., Syracuse, N. Y., died June 11. He formerly was in charge of the construction projects at the Solvay Process Co. plant in Syracuse.

J. Cox Cornelius, 86, formerly a civil engineer with the Reading Railroad, died in Easton, Pa., June 17. He served 33 years with the Taylor-Wharton Iron & Steel Co. and later was with the Easton Car and Construction Co. He was one of the oldest graduates of Lehigh University.

C. Don Field, 53, president of the Los Angeles Board of Public Works and former California assemblyman, died in Los Angeles June 9. He was partner and general manager of the Field Transportation Co. until his retirement last year. He was author of the Field Act, California's earthquake law. He was general chairman of the American Public Works Assn. convention to be held in August.

Emmanuel Monfalcone, 67, until his retirement May 31 head engineer of the Design Division, Planning Department, at the Naval Shipyard, Portsmouth, Va., died June 7. His post is the highest ranking civilian position in the yard. Monfalcone had been employed with the naval shipyard since 1912. For ten years prior to that he was with the Newport News Shipbuilding and Dry Dock Company. In 1950 Monfalcone received a special commendation from the Commander-in-Chief of the Atlantic Fleet for his work on the aircraft carrier Leyte.

Charles W. Bunnell, 47, a civil engineer in the design division of the Milwaukee, Wis., bureau of sewers, died June 9. He was a graduate of the University of Minnesota in 1927 and was employed by the Allis-Chalmers Manufacturing Co. and the federal government before joining the bureau of a sewers staff four years ago.

Herrman Muller Knauth, 65, retired Asheville, N. C., engineer, died June 7. He served with the 108th Engineers during World War I.

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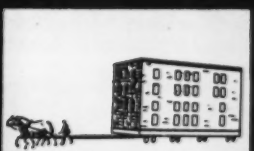

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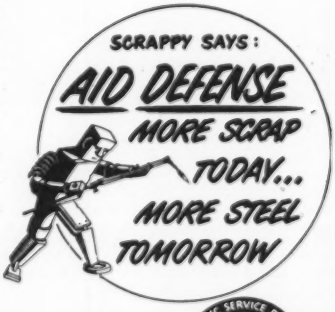

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(Continued on page 70)

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(Continued on the opposite page)

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(Continued from opposite page)

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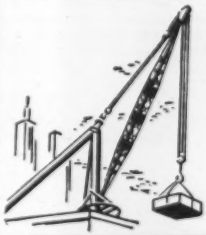

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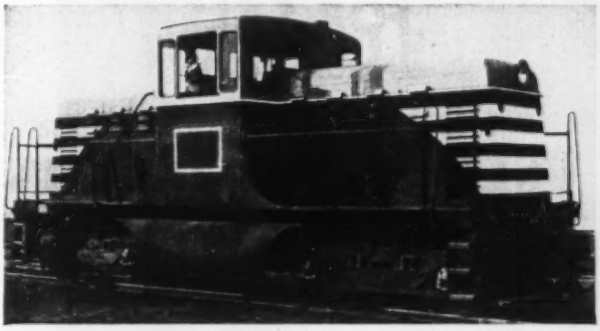

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Syosset 6-1083 L. I., N. Y.

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Aberthaw Co The....75, 76
Albert Pipe Supply Co Inc....72
Amerlux Steel Products Corp....77
American Technion Society....70
A & P Crane Equipment Corp....76
Austin Bridge Co....76
Bendix Machinery Co Inc....75
Builders Steel Supply Co....74
Carroll & Edwards Co....76
Casey & Emmert Inc....74
Chemical Co....76
Clemens Construction Co....72
Commercial Metals Co....74
Concrete Equipment Co....73
Contractors International Supply Corp....75
Dalton Supply Co....73
Davidson Pipe Co Inc....72
Davis Construction Corp....75
Deatherage & Son George E....71
Drachman Steel Corp Hy....77
Ehbar Inc Edward....74
Equipment Corp of America....73
Fabick Tractor Co John....73
Foster Co J M....77
Foster Co L B....74, 77
Frank M K....76
Frazier-Davis Construction Co....75
Fritz Steel Corp....74
Groves Sons S J....73, 74
Gurley W & L E....71
Hodge & Hammond Inc....74
Hyman-Michaels Co....72
Jones Construction Co J A....77
Judge Frank M....75
Kalil Co....72
Kaufman Construction Co Inc....77
Kennedy Inc D D....77
Keystone Construction Co....74, 76
Knox County Highway Dept....70
Lubrecht Wm III....76
Martin L S....77
McKee & Co, Arthur G....70
Meagher & Sons Inc W. J....75
Metropolitan Transit Authority....76
Midwest Steel Corp....74
Mississippi Valley Equipment Corp....77
Ornitz Equipment Corp....71
Payne-Oliver Concrete Co Inc....74
Petersen Engineering Co....69
Quist Construction Co....76
Reading Inc Eugene P....72, 74
Rex Trailer Co Inc....75
Richardson & Gordon....70
Sanderson, Keith....73
Schultz Contracting Co Inc John B....73
Shirley H C....72
Smith Co H Y....76
Stanhope Inc R C....72, 77
Steinman D B....70
Subgrade Eng Corp....77
Swabb Equipment Co Inc Frank....71
Tagco Inc....72
Tractor & Equipment Co....73
United Foundation Corp....69
United Tractor & Equipment Corp....75
Vilbro Equipment Co Inc....73
Weil & Co J H....71
Williams Construction Co....71
Wilson Engineering Corp....71
Wobril Manufacturing Co....69

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July 10th Issue of

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Close for press earlier than the usual weekly closing time.

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ASTORIA, NEW YORK
AStoria 8-4484 8-8023

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We do a Nation-Wide business in

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485 pcs. 85-20 ft. Beth. SP-6A—Maryland
240 pcs. 60 ft. Carn MP-116—Illinois
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Other lengths & sections used & new at other locations in United States for rent.

We have Nation-wide reputation for effecting QUICKEST SHIPMENTS

All sizes Vulcan & McKiernan Pile Hammers & Extractors for rent—Shop Rebuilt

Regardless of location of job, Wire, Write or Phone

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 4474 St. Louis, Mo.

HOIST AND SWINGER FOR SALE

One—Thomas—2 drum electric hoist, 220/440 volt, 60 cycle, with attached swinger. Line Pull 12,000#. In good condition. Location—Kansas City, Missouri. Full price $6,500 f.o.b. Kansas City, Missouri.

This unit may be seen by contacting Mr. T. H. Sandvik at Kansas City, Missouri, Benton 2509. Nite: Victor 9731.

For further information contact

Subgrade Engineering Corporation
2123 South 56th Street, Omaha, Nebraska
Phone Walnut 7798,
or, 8221 Atlantic Avenue, Bell, California,
Phone Logan 5-7421

FOR SALE

3000' New Blaw-Knox 12x12 Airport Forms
3000' New Blaw-Knox 15x15 Airport Forms
1—Multifoote 34E Single Drum Paver with elevated boom, excellent condition
1—LeTourneau 8-10 yd. scraper, good condition
1—Caterpillar D7 with Trackson Loader, good condition
1—Caterpillar D7 with LeTourneau Bulldozer and Power Control Unit, excellent condition
1—Late Model Adnun Black Top Paver, excellent condition
1—LeTourneau Model C Tournadozer, rebuilt
1—Caterpillar D4 with LaPlant-Choate Bulldozer
1—International TD9 Tractor Loader, good condition
1—Ingersoll-Rand 315 Compressor, good condition

FOR RENT OR SALE

1—Allis-Chalmers Model HD20 with Tractomotive Side Boom, used two months
1—Allis-Chalmers Model HD19H with Baker Hydraulic Bulldozer

D. D. KENNEDY, INC.
Mannheim Road (U. S. 45) at Madison St.
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Phone: (Chicago) Estebrook 8-5223
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STEEL SHEET PILING

213 PCS. ZP-32 LB. 50 FT. Z BAR.
243 PCS. BETH. DP-1—50 FT.
550 PCS. CARNEGIE M-116—45 FT.
165 PCS. BETH. AP-3—60 FT., 35 FT. & 20 FT.
298 PCS. BETH. DP-2—60 FT.
600 PCS. BETH. SP-6-A, 22—30—40—80 FT.
41-B & MARION 32 STEAM CRANES.
3—110 3 & 55 M.K.T. HAMMERS

STANHOPE, 60 E. 42nd St., N. Y. 17, N. Y.

FOR SALE

OAK PILING

450 pieces peeled 40' to 45' long. Immediate delivery. Location: Mansfield, Ohio

J. M. FOSTER & COMPANY
BOX 622, GARY, INDIANA

FOR SALE

1 Marion #331 Special, Shop No. 8783, Crane and Drag line, 50 foot boom, 14 foot cats, 30 inch pads, equipped with D8800 Cat. Diesel motor.

1 Jeager Lakewood finishing machine No. 1 x B.

1 Hertzel aggregate bin, new 1950, 3 compartment with scales and 1¼ cu. yd. hopper.

Located at Montour Falls, N. Y. 12 miles from Elmira on Route 14.

Will sell in entirety for $10,500.00.

L. S. MARTIN
349 Marshland Court Troy, N. Y.

FOR SALE

40,000 Sq. Ft. METAL FORM PANELS FOR BRIDGE OR FLOOR SLAB

Especially designed for economy and used on Chesapeake Bay Bridge.

KAUFMAN CONSTRUCTION COMPANY, Inc.
4000 Pulaski Ave. Phila. 40, Pa.

OFFICIAL PROPOSALS

Bids: July 10, 1952

Bridges No. E2.57 & F2.19

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of Bridges No. E2.57 and F2.19 and Approaches on Old York Road in Mansfield and Chesterfield Townships, Burlington County, Federal Aid Secondary Project No. S-40(2).

The principal items of construction are:

Estimated:
- Lump Sum—Clearing Site
- 3,085 cu. yds. Channel Excavation
- 629 cu. yds. Foundation Excavation
- 2,360 lin. ft. 12" Timber Piles (Plain)
- 395 cu. yds. Class "C" Concrete
- 143 cu. yds. Class "B" Concrete
- 30,897 lbs. Reinforcing Steel

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, July 10, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 2 W. Federal St., Burlington, N. J. or 6 N. Willow St., Trenton, N. J. The attention of the bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: July 22, 1952

Traveling Cranes

CONTRACT 410

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday July 22, 1952, for Contract 410, for furnishing, testing and delivering 15-ton and 3-ton electric traveling cranes and appurtenances for installation in the Neversink and East Delaware intake chambers and the Downsville release water chamber of the Delaware system, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of fifteen thousand dollars ($15,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and specifications, contract and drawings, requirements as to surety, etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING T. A. HUIE, President, RUFUS E. McGAHEN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: July 10, 1952

Route 4, Section 47

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Resurfacing the South Approach to the Victory Bridge, Route 4, Section 47, in in the Borough of Sayreville, Middlesex County. Length 0.607 mile. The principal items of construction are:

Estimated:
- 3,150 tons Bituminous Concrete Surface
- 1,870 lin. ft. Plain Concrete Curb
- 3,740 lin. ft. Reset Concrete Curb

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, July 10, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: July 10, 1952

Hangar #6

NEW YORK INTERNATIONAL AIRPORT
FOUNDATIONS
CONTRACT NYA-280.063

Sealed proposals for the construction of the foundations (exclusive of grade beams, columns and floor slabs, but including column anchor bolts and grade beam dowels) for Hangar No. 6 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:00 A.M., Thursday, July 10, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $25 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 26, 1952

Bids: July 9, 1952

Interior Finish—Rooms No. 244 and 113

PORT AUTHORITY BUS TERMINAL
CONTRACT BT-110.061

Sealed proposals for furnishing and installing interior store finishes for Rooms No. 244 and 113 in the Port Authority Bus Terminal will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:00 o'clock A.M., Wednesday, July 9, 1952 at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $25 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 26, 1952

U. S. Government

Department of Commerce, Bureau of Public Roads, June 17, 1952. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., D.S.T., JULY 9, 1952, for Project 1E1-1F4, Baltimore-Washington Parkway, Prince Georges County, Maryland, 1.864 miles Grading and Drainage from near East-West Highway to Laurel-Bowie Road. The approximate quantities of the more important items are: 343,000 cu. yd. Excavation, 60,000 cu. yd. Borrow for Topping, 6,200 cu. yd. Gravel Base Course, 1,075 cu. yd. Cement Concrete and 6,750 lin. ft. Concrete Culvert Pipe. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: July 10, 1952

N. Y. State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, Albany, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on July 10, 1952, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the state Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, Dist. Engr., 353 Broadway, Albany, N. Y.				
Albany	C.T.52-2P C.T.C52-3P R.C.52-73 S.T.52-14 S.T.C52-15	New York State Thruway Catskill Section, Subdivision 1-3 Slingerlands-Albany, S.H.5237 Albany-Guilderland, S.H. 5135 City of Albany: Delaware Ave & Krumkill Rd., Russell Rd., & Schoolhouse Rd., C.R. 204	(1.53 Cross Roads) 4.65	9" Cem. Conc. Pavt. 2 at 25' Wide = 4.65 mi. (9" Cem. Conc. Pavt 52'-44' Wide = 0.45 Mi. Cross Roads) (Asp. Conc. Ty. 1A, Opt. = 1.08 Mi. Cross Rds.) 6 Hy. Sys. Alpha I-Beams 279.15'; 274.7'; 48.64'; 256.56'; 243.6'; & 285.67' (Incidental Sewers & Detour Work)	$165,000 Plans $100	$3,020,000
		DISTRICT No. 2				
		Lacy Ketchum, Dist. Engr., 109 No. Genesee St., Utica, New York				
Hamilton	FARC52-70	Noblehoro-Morehouseville S.H. 874, Proj. F-455 (3)	3.24	Asp. Conc. Ty. 1A, Opt.	$10,000 Plans $10	191,000
Oneida	FARC52-64	Augusta Rd., Lowell & Spencer Sections, SH438 Proj. S173(2)	4.52	Asp. Conc. Ty. 1A, Opt.	$14,000 Plans $10	274,000
		DISTRICT No. 3				
		William Robinson, Dist. Engr., 301 East Water Street, Syracuse, N. Y.				
Wayne	FAS852-11	South Butler-Conquest, Pt. 1 (Co. Rd.) Proj. S285(1)	3.24	Bit. Mac. Opt.	$10,000 Plans $10	186,000
Cayuga & Onondaga	FARC52-67	Auburn-Skaneateles, Pts. 1&2, S.H. 9037 Skaneateles Vill.: Genesee St.; Skaneateles-Lafayette, Pt. 1, S.H. 8356 Skaneateles-Lafayette, Pt. 2, S.H. 8360 Marietta-Marcellus, S.H. 971 Proj. F470(15) (Cont. No. 1)	10.95	Asp. Conc. Ty. 1A, Opt.	$51,000 Plans $25	949,500
Onondaga	FARC52-68	Marietta-Marcellus, S.H. 971 Skaneateles-Lafayette, Pts. 2&3, S.H. 8360-8373 Proj. F470(15) (Cont. No. 2)	11.21	Asp. Conc. Ty. 1A, Opt.	$55,000 Plans $25	1,015,800
		DISTRICT No. 5				
		C. R. Waters, Dist. Engr., 65 Court Street, Buffalo, N. Y.				
Chautauqua	FARC52-61	Cassadaga-Fredonia, S.H. 938 Fredonia Village, S.H. 1062 Proj. F426(3)	1.22	Asp. Conc. Ty. 1A, Opt. = 1.18 Mi. Misc. Work = 0.04 Mi.	$10,000 Plans $10	189,000
Erie.....	FAC52-6	City of Buffalo: Delaware Ave. Proj. U1078(2)	1.63	Traffic Signal System	$3,000 Plans $10	54,000
		DISTRICT No. 6				
		H. F. Brumm, Dist. Engr., 38 West Main Street, Hornell, N. Y.				
Allegany	FARC52-65	Belfast-Transit Bridge, S.H. 1259 Proj. F465(5)	3.97	Asp. Conc. Ty. 1A, Opt.	$13,000 Plans $10	234,000
Allegany...	FARC52-66	Belfast-Caneadea, S.H. 5615 Proj. F465(4); F380(6)	7.28	8" Cem. Conc. Pavt. Var. Wdth. = 6.83 Mi. Asp. Conc. Ty. 1A, Opt. = 0.44 Mi. Misc. Work = 0.01 Mi. Twin Conc. Box Br. 44' x 7'	$75,000 Plans $25	1,325,000
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Dutchess	FARC52-43	Manchester Bridge-Billings, S.H. 8364 Manchester Bridge-Billings, Pt. 1, SH9298 Proj. F521(4)	5.21	Asp. Conc. Ty. 1A, Opt.	$10,000 Plans $10	181,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick St., Binghamton, N. Y.				
Broome	FARC52-69	Castle Creek, S.H. 267 Proj. F717(2)	5.63	Asp. Conc. Ty. 1A, Opt.	$11,000 Plans $10	202,000
Sullivan	FAS852-5	Livingston Manor-Youngsville, Pt. 2 Proj. S317(1)	4.50	Bit. Treat. Stone = 4.48 Mi. Misc. Work = 0.02 Mi. 3 I-Beam Bridges 42.4', 50' & 50'	$35,000 Plans $25	642,000
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Little E. Neck Rd. & Montauk Hwy., Babylon, L. I., N. Y.				
Suffolk	SMSP52-1	Sunken Meadow Spur Parkway (Cont. No. 1)	3.03	Grading & Drainage (Incl. Detour & Marg. Rds.)	$57,000 Plans $25	956,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

OFFICIAL PROPOSALS

Bids: July 16, 1952

Constructing Sanitary Sewers

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SEWERS
NOTICE OF LETTING

Sealed bids or proposals in duplicate, addressed to the Board of Estimates of the Mayor and City Council of Baltimore, and marked "Bid for Constructing and Completing Sanitary Sewers and other work in Baltimore City, Maryland", as embraced in Sanitary Contract No. 400, will be received at the office of the Comptroller, Room 204 City Hall, Baltimore, Maryland, until, but not after, Wednesday, July 16, 1952, at eleven o'clock A.M. (positively no bids will be received after 11:00 o'clock A.M.), Eastern Daylight Saving Time, and at twelve o'clock Noon, on said date they will be publicly opened and read by the Board of Estimates in Room 231 in said City Hall.

The approximate quantities involved are as follows:

Schedule "A"

7,290 Lin. Ft. Excavation for 30" to 42" Monolithic Concrete Sewer in tunnel.
685 Lin. Ft. Excavation for 36" Monolithic Concrete Sewer in open trench
85 Lin. Ft. Excavation for 12" Vitrified Pipe Sewer in tunnel
75 Lin. Ft. Excavation for 8" to 10" Vitrified Pipe Sewer in open trench
155 Lin. Ft. Furnish and Lay 8" to 12" Vitrified Pipe Sewer
350 Lin. Ft. Manholes
2,600 Cu. Yds. Class "A" Concrete Masonry
2,800 Cu. Yds. Class "B" Concrete Masonry
21,000 Lbs. Reinforcing Steel
38,300 Sq. Ft. Vitrified Clay Liner Plates
6,300 Lin. Ft. Furnishing and Driving Piles, etc.
Other Miscellaneous Items

Schedule "B"

7,290 Lin. Ft. Excavation for 30" to 42" Reinforced Concrete Culvert Pipe, one-half (½) vitrified clay liner plate lined sewer, in tunnel.
685 Lin. Ft. Excavation for 36" Reinforced Concrete Culvert Pipe, one-half (½) vitrified clay liner plate lined sewer in open trench.
85 Lin. Ft. Excavation for 12" Vitrified Pipe Sewer in tunnel.
75 Lin. Ft. Excavation for 8" to 10" Vitrified Pipe Sewer in open trench.
7,750 Lin. Ft. Furnish and lay 30" to 42" Reinforced Concrete Culvert pipe, one-half (½) vitrified clay liner plate lined sewer.
155 Lin. Ft. Furnish and lay 8" to 12" vitrified pipe sewer.
350 Lin. Ft. Manhole
150 Cu. Yds. Class "A" Concrete Masonry
4,310 Cu. Yds. Class "B" Concrete Masonry
21,000 Lbs. Reinforcing Steel
6,300 Lin. Ft. Furnishing and Driving Piles, etc.
Other Miscellaneous Items

Plans, specifications, and other contract documents may be obtained at the office of the Sewerage Engineer, 12 Municipal Building, Baltimore, Maryland, upon payment of Five Dollars ($5.00) for each copy, which amount will not be refunded.

A certified check of the bidder drawn on a solvent clearing house bank made payable to the Mayor and City Council of Baltimore for the sum of Twenty-Five Thousand Dollars ($25,000.00), will be required with each bid.

Bond in the amount of the contract price, will be required of the successful bidder.

Attention of Bidders is called to the minimum wage rates to be paid on this project.

The Board of Estimates reserves the right to reject any and all bids and/or to waive technical defects, as it may deem best for the interest of the City.

Bids when filed shall be irrevocable.

APPROVED:
JOHN J. HUNT,
SEWERAGE ENGINEER

(Continued on the following page)

OFFICIAL PROPOSALS

Bids: July 15, 1952

Building No. 140

PORT NEWARK
CONTRACT PN-200.004

Sealed proposals for the construction of Building No. 140 at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Avenue, New York 11, until 11:00 A.M., Tuesday, July 15, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $25 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, June 26, 1952

Bids: July 7, 1952

Construction of a Drain in Porter and Willow Streets

NOTICE TO CONTRACTORS
NORTH ADAMS, MASSACHUSETTS

Sealed bids for constructing a reinforced concrete drain will be received at the office of the Commissioner of Public Works, City Hall, North Adams, Massachusetts, until 2:00 p.m. Eastern Daylight Saving Time on July 7, 1952 and at that time and place will be publicly opened and read.

The work includes about 670 ft. of 60-in. diameter drain with manholes and appurtenances.

Drawings and documents may be obtained at the above office or at the office of Metcalf & Eddy, Statler Building, Boston, Massachusetts, $10 deposit.

Bid security, certified check for $7,000 made payable to the Treasurer of the city of North Adams, Mass., must be submitted with each bid. Successful bidder must furnish 100% performance bond.

Minimum wage rates and Public Work conditions of employment applicable.

The right is reserved to reject any or all proposals or to accept the one deemed most advantageous for the city of North Adams.

HENRY A. GALIPEAU,
COMMISSIONER OF PUBLIC WORKS
NORTH ADAMS, MASSACHUSETTS

Bids: July 7, 1952

Alterations to Food Fair Refrigeration System

PORT AUTHORITY BUS TERMINAL
ALTERATIONS TO FOOD FAIR
REFRIGERATION SYSTEM
CONTRACT BT-110.070

Sealed proposals for performing alterations to the Food Fair Refrigeration System at the Port Authority Bus Terminal will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:00 A.M., Monday, July 7, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $10 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, June 26, 1952

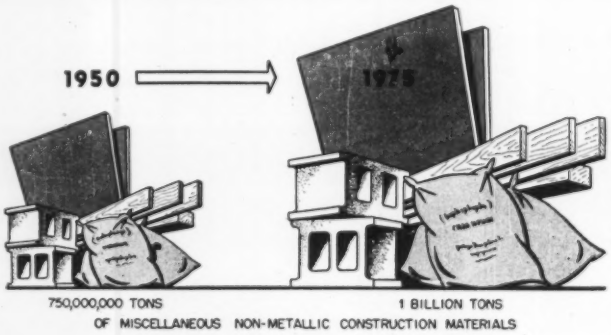
OFFICIAL PROPOSAL

RATE: $1.50 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

BUSINESS AND FINANCE



25-year boom in construction to force better use of materials

Construction business is going to boom in the 25 years from 1950 to 1975. Building demand may rise more than 35% by 1970. With this growth in volume will come at least one "headache"—the materials problem.

That's the view set forth this week by the President's Materials Policy Commission, which has just wrapped up a 17-month study of the resources outlook for the quarter century from 1950 to 1975.

Although the commission tackled the job of matching the needs of an ever-expanding national economy against U. S. material resources—the group paid special attention to construction. The reason: Construction is the largest single user of materials in the U. S. economy.

A look at 1950 shows how important the materials resources situation can be to construction. In that year, the construction industry, for new building and maintenance, took one-third of the copper, one-sixth of the iron and steel, one-fifth of the lead, one-fifth of the zinc, and nearly two thirds of the lumber consumed by all industries in the nation. (See p. 21).

• **Market for materials**—With the growth in volume, consumption of building materials will rise about one-third by 1975.

Should the "materials mix" used by the building industry stay as it is now, the demand against already scarce materials—like copper, lead, zinc and lumber—would increase in the same proportion—about one-third.

Such a trend would intensify the materials problem, the report declares. Only by shifting from tight materials to more abundant ones can the situation be relieved. Hence the commission's interest in building technology and improvement of building methods—all based on the commission's fundamental concept of cutting costs through better use of materials.

Shifts that are economically feasible may reduce the building industry's 1975 demand for copper by more than half, lumber by one-half, lead by one-fourth and zinc by one-fifth, the report says.

There would be tremendous in-

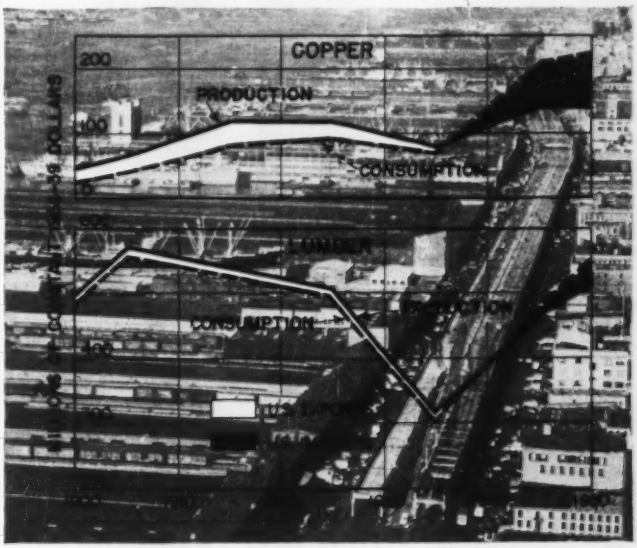
MAJOR ECONOMIC FORECASTS

End-use or Aggregate	Approximate Percentage Growth from 1950 to 1975
Population	27
Labor Force	27
Gross National Product	100
Gross Private Domestic Investment	40
Construction (total)	30
Residential Construction	15
Private Nonresidential Construction	50
Number of Dwelling Units in use	50

creases in use of aluminum and plastics and more modest increases in use of such relatively abundant materials as glass, asphalt and gypsum products, concrete and various concrete aggregates.

In forecasting the future for building materials, the commission has taken into account some improvement in design and methods. But it has not assumed total replacement by 1975 of one material by another, or any startling changes in design or methods. A bolder approach, it candidly states, could prove more accurate.

Electronic air conditioners, cheap power-transmission without wires, structural materials with high insulating properties—made transparent or opaque at will, and use of the sun's energy for heating and cooling could revolutionize building materials use.



THE REPORT notes a shift from export to import in copper and lumber.

• **Steel-framed houses**—Framing, it thinks, may bring the biggest shift in materials. Many houses, it says, may be steel-framed. Dead loads in larger structures, whether steel-frame or reinforced concrete, will be reduced by lightweight aggregates, greater use of prestressed concrete, reinforcing bars with improved bonding characteristics, and new welding techniques—along with more reasonable safety standards—would cut steel requirements. The trend toward concrete slabs as foundation and floor will increase the demand for cement and aggregates. Over all, use of aggregates will go up in volume but not so much in weight, because more use will be made of the lighter aggregates.

These and other developments will ease the pressure on U. S. lumber supply. Equal or even greater advances are in prospect for plumbing, heating, air conditioning and electrical systems. Changes now in sight would save large amounts of copper, steel, zinc and iron.

• **Technical advances studied**—Innovations in building construction are discussed in another part of the commission's report—a 17 page chapter of Volume IV. Prepared by Arthur D. Little, Inc., this section analyzes improvements in the technology of wood and wood products, non-metallic mineral products, metallic products, plastics, and other synthetics, temperature regulation and construction methods.

Improvements of this sort, the commission says, are being retarded in application by local building codes.

• **What's the problem?**—Overall, the commission makes a logical forecast—a doubling of the U. S. economy in the next 25 years.

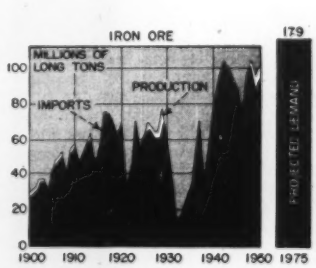
Then the commission asks: "How do we meet these huge increases in demand for materials?"—and answers:

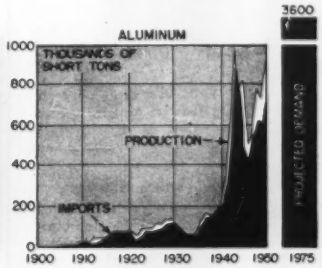
New and expanded government programs of technical and economic research, new and expanded use of subsidies, grants and loans, and new legislation.

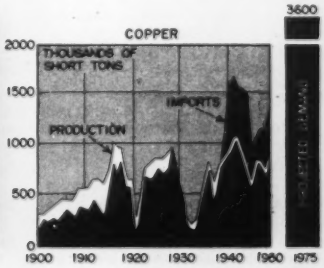
• **Real threat, rising costs**—Actually, the commisison nowhere holds up the Sunday-supplement type of specter—that the U. S. will some day run dry of key materials and collapse.

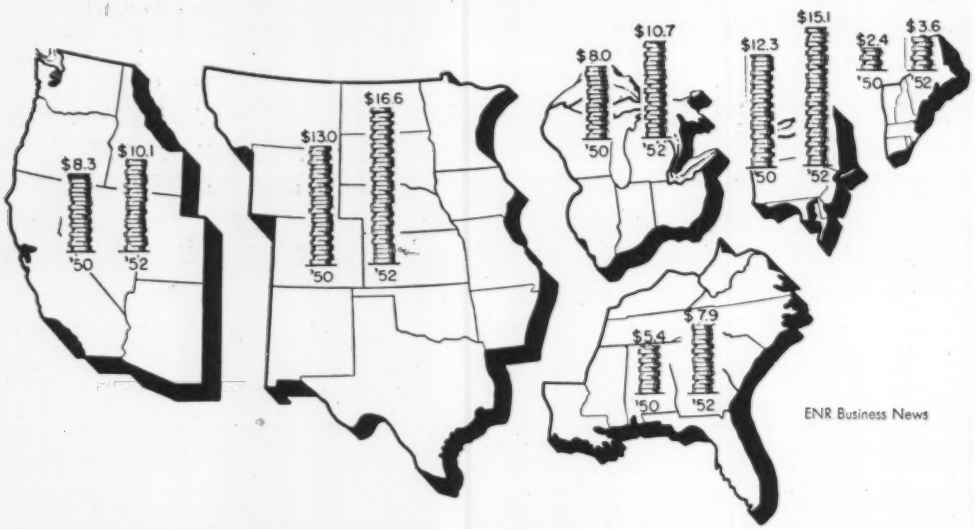
The commission says: Absolute shortages are not the threat. The threat of the materials problem lies in insidiously rising costs.

Over the last 50 years, real costs of materials have been declining. Now, the commission reports, this decline in absolute costs of materials has slowed.









ENR BACKLOG of proposed construction as of May 31, 1950 and May 31, 1952, in millions of dollars.

Private construction boosts backlog; proposed work now totals $64 billion

ENGINEERING NEWS-RECORD's backlog of proposed heavy construction reached a cumulative total of $64 billion at the end of May—$745 million higher than the previous month.

It was the biggest month-to-month gain in the backlog this year.

The backlog of new proposed work has mushroomed by $15.6 billion since the end of May, 1950—shortly before the outbreak of the war in Korea.

Private construction scored the biggest increase in the backlog during May. Of the $610-million increase for private construction, $383 million was for new industrial plants.

Another $139 million was in private unclassified projects. This is the area where pipelines and transmission lines predominate.

The backlog of new commercial buildings rose $82 million during the month of May.

The backlog of public construction was $142 million higher at the end of May. Leading the way were public buildings, up $84 million; highways, up $51 million; and bridges, up $37 million.

• **West shows biggest gain**—The region west of the Mississippi River had the biggest rise in its backlog of engineered construction. It led all other sections of the country with nearly $500 million more of proposed work at the end of May.

Most of this gain was due to the $300 million Taconite development facilities for the Erie Mining Co., to be located in Aurora, Minnesota. In addition, Texas had $90 million more of new proposed industrial building in its backlog.

The area west of the Mississippi also accounted for most of the total increase in proposed commercial building, with $43 million more in May. Texas was responsible for $34 million of this.

• **California spurs private total**—The Far West took credit for most of the gain in the backlog of private unclassified construction during May. Its backlog was up $92 million, due mainly to California which had $87 million in additional proposed work of this type.

The region west of the Mississippi also figured in rise in private industrial building, with a $27 million gain—almost all of which was scored by Texas.

In the public buildings classification, the Middle Atlantic region led, as it added $91 million to the backlog. New Jersey alone registered a $66-million increase in this direction.

The South had the largest gains in backlog of public works with an increase of nearly $140 million. West Virginia's $96 million in additional proposed highway construction was the big item.

Briefs . . .

• **Housing starts**—The Bureau of Labor Statistics reported that housing starts for May added up to 107,000, compared to 108,000 in April. The total for May, 1952 was 6,000 higher than in May, 1951.

• **Cost index up**—Smith, Hinchman & Grylls reported the first rise in their building cost index since January, when the index reading was 263 (1926 equals 100). The index remained at this level during February, March and April, and then rose two points in May, to a new reading of 265.

• **OPS grants price boost**—A 15 cents per barrel increase in the price of its gray cements has been granted to the Calaveras Cement Co., by the Office of Price Stabilization. But the firm, believed to be the first cement firm to receive an OPS price increase under the Capehart Amendment, doesn't plan to raise prices until the increase is authorized on an industry-wide basis. OPS has not disclosed whether other cement firms are seeking price increases.

DPA to slow down on tax benefits

The Defense Production Administration has shut down the flow of its approvals for five-year tax amortization for new productive capacity to a mere trickle.

But DPA will continue issuing certificates for fast tax write-offs for a long time to come—but at a slower rate.

It is now apparent that the actual construction of new plant covered by the 11,000 certificates issued since Korea is well beyond the half-way mark.

But even though the bulk of new structures are in place, the job of filling them with equipment isn't nearly so far advanced.

Similarly, a number of the approximately 5,000 additional applications pending with the government cover projects on which plant construction has been completed, or, at least, is well underway.

There is still a lot of new construction yet to be completed both in approved and pending applications. But it is difficult to get an accurate gauge of just how much. Here's why:

The Defense Production Administration has established goals for only about half of the 258 types of raw materials, machinery and equipment eligible for fast amortization.

Some of these goals have already been met. That is, DPA has granted —or has pending—applications for rapid amortization for sufficient capacity to meet these goals.

But, in some industries—the basic metals, for example—it is a sort of half-and-half meeting of objectives.

On steel, DPA is assured of amortized projects to produce all the blast furnaces and ingot production it wants. But DPA is still looking for capacity to produce forgings, plates, structural shapes, cold finished bars and tubes.

City opens probe on construction

Whispered charges that millions of dollars in waste and extravagance have been frittered away in the planning and building of Philadelphia's International Airport have erupted into the open with the city council authorizing a full-scale investigation into the charges.

Some $25 million has been spent so far on the airport which is located on ground bordering the meadow lands in the city's southwest.

• **Appropriate $10,000 for probe**—The Philadelphia City Council has appropriated $10,000 for auditing and technical expenses to get the full-dress probe started by a committee headed by Councilman Victor H. Blanc.

What touched off the probe was a recent inspection by Philadelphia officials of the newly completed Pittsburgh Airport.

Philadelphia officials were impressed. They learned that Pittsburgh completed its airport for much less money than Philadelphia has already put out for a still-uncompleted project.

Blanc said his council committee (commerce, navigation and airport facilities) has heard charges of waste and extravagance from reputable sources. It is imperative to determine whether the reports are well-founded or merely rumors, Blanc said.

Many councilmen feel Pittsburgh has built a comparable "or possibly better airport for less money," Blanc said. "We agreed that before we approve any more appropriations for Philadelphia International Airport we want to be convinced that none of the money is being wasted."

The councilman said he is inclined to be critical of the type of contract under which the engineering consultants, Airways Engineering Consultants, Inc. are operating.

For drawing the plans and supervising construction, the contract calls for a flat fee of 5% of costs. Out of this, the engineering firm must pay the architectural fees.

"Under such a contract, there is no compulsion on the part of the engineering consultants to shave costs," Blanc said. "However, if there was no waste or extravagance in the planning or building, that fact should be brought out in order to still rumors," he said.

• **Full-scale investigation**—The scope of the investigation will take in the planning and construction of the new $15-million terminal building which is now 60% completed, the contracts for improvements to the field itself, including new taxiways and lengthening of runways, and the number, type, and manner of granting concessions that and an important part of the airport's revenue.

Another investigation will be made of the Greater Pittsburgh Airport, for a basis of comparison.

Blanc said that delays in the planning and building of the Philadelphia Airport held up awarding of contracts and that meanwhile the Korean war inflation boosted costs.

Whether or not Philadelphia, aside from this, fared worse than Pittsburgh, is expected to be a key point in the investigation.

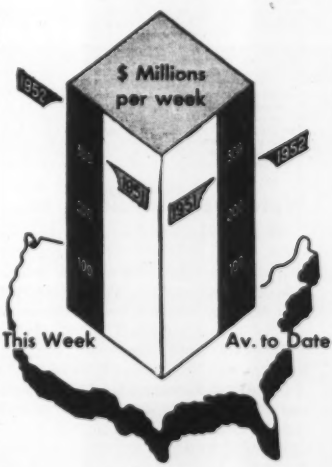
Correction

Shelley Steel Corp., of Chicago, which acquired the William F. Klemp Co., in November, 1951, has announced a change of name of the Klemp organization to that of Klemp Metal Grating Corp.

Emerson C. Whitney, formerly president of the Klemp organization, has resigned his post and affiliations with that group. Through error, ENR recently reported that the Klemp name had been discontinued.

Activity This Week

As reported to ENR (in millions of dollars)



Contracts by type of work

	This Week	Cumulative 26 wks 1952	1951	% chge
Waterworks	$3.4	$117.8	$115.4	+2
Sewerage	6.0	128.0	164.3	−22
Bridges	15.0	194.5	153.2	+27
Highways	56.2	740.5	546.8	+35
Earthwork, waterways	14.1	284.1	273.4	+4
Buildings:				
Public	44.8	945.1	1,111.6	−15
Housg., pub.	8.7	436.5	329.9	+32
Housg., priv.	76.8	1,479.2	1,024.9	+44
Commercial	16.8	317.0	346.9	−9
Industrial	92.3	1,499.3	2,374.8	−37
Unclassified	31.0	640.7	841.7	−24
Total	**$365.1**	**$6,782.7**	**$7,282.9**	**−7**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		Base Year = 100 1913	1926	1949
Constr. cost.	June	561.69	270.00	117.75
	May	557.11	267.80	116.79
Bldg. cost	June	412.50	222.98	117.26
	May	410.30	221.50	116.65
Volume	May	554	225	160

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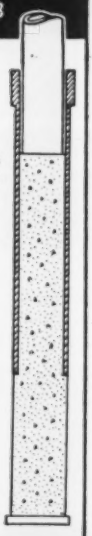

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B. H. Mueller Co., 8825 Delmar Blvd., St. Louis 5, Mo.
Ole K. Olsen Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard, 2858 Addison, Houston 8, Tex.
Western Steel Prod. Co., 1785 W. 13th Ave., Denver 4, Colo.

UNIT PRICES

Highway bridge, Ft. Kent, Maine

Construction began this month on the 3-span steel beam Main Street Bridge, Fort Kent, Maine. It includes a 28-ft wide concrete roadway and two 5-ft sidewalks. The spans are 65, 75, and 65-ft long. The substructure consists of concrete piers on pile foundations. Max L. Wilder is the chief bridge engineer for the Maine State Highway Commission.

Minimum wage rates per hour to be paid for skilled labor on this project are $1.15, $0.91 for semi-skilled; and $0.83 for unskilled.

Bidders include:

1C	Norman E. Jackson, Inc., Pittsfield, Me.	$203,065
2	W. H. Hinman, Inc., N. Anson, Me.	205,518
3	P. E. Susi & Co., Pittsfield, Me.	213,048

Bids: 5-14-52 Items	Unit	Quantity	Unit Price 1 C	2
Removal of exist superstruct	ls	1	$5,000	$2,200
Maintenance of traffic	ls	1	8,000	24,000
Maintenance of pedes traffic	ls	1	2,000	2,000
Cofferdams, pier no. 1	ls	1	15,000	10,500
pier no. 2	ls	1	11,000	8,000
Struct earth exc, abuts & ret walls	cy	1,400	$4.00	1.35
piers	cy	260	8.00	5.00
Earth exc, roadway & drain	cy	1,100	1.00	2.00
Backfill	cy	150	1.50	2.60
Common borrow	cy	100	1.00	2.00
Rip-rap	cy	535	7.00	8.00
Stone fill	cy	220	5.00	5.25
Loam	cy	300	.3.00	2.75
Sodding	sy	10	2.00	2.75
Seeding, roadside mixture	Msf	16	20.00	13.50
Gravel base	cy	980	1.50	2.00
Gravel surfacing	cy	25	3.00	2.70
Bit surf treatment, cls A	gal	85	1.00	0.40
Wire cable guard rail, typ B	lf	230	1.50	2.00
Anchorages, guard rail, typ A	ea	2	30.00	25.00
type B	ea	3	30.00	25.00
at bridges, type B	ea	3	20.00	25.00
Asp coated corr metal pipe, 12"	lf	60	4.00	3.00
Drop inlets, type A	ea	4	300.00	275.00
Crushed stone base	t	295	15.00	12.50
Bit macadam surf course	t	90	17.00	13.50
Emulsified asphalt	gal	1,700	0.50	0.25
Project markers	ea	2	20.00	25.00
Conc abuts & ret Walls	cy	195	41.00	45.00
in piers	cy	455	41.00	37.50
in piers, under water	cy	99	30.00	23.00
in roadway & sidewalk slabs	cy	205	60.00	62.50
in wearing surface	cy	54	30.00	30.00
Reinf steel, delivered	lb	56,160	0.11	0.12
placing	lb	56,160	0.03	0.06
Cement	bbl	1,400	5.20	7.00
Wrought iron rail	lf	429	12.00	11.00
Piles, wooden untreated	lf	2,400	4.00	2.75
Structural steel, delivered	lb	326,000	0.12	0.11
erection	lb	326,000	0.03	0.06
Removal of existing conc	cy	550	15.00	6.75
Bit macadam sidewalk	t	21	25.00	13.50
Asphalt cement	gal	1,900	0.50	0.35
Granite curb	lf	320	8.00	5.50
Circular granite curb	lf	15	9.00	7.00
Underdrain, type B	lf	230	3.50	2.00
12", type C	lf	200	5.00	4.50

Water works addition, Ill.

The $573,000 Glencoe, Illinois water works improvement project will increase the rated capacity to 3 million gallons per day. Work includes new settling basins 77'x45'x30½' overall, filter and clearwell substructures 35'x53'x30' high, improving mixing facilities and the present building.

Montague Constr. Co., of Chicago, was awarded the main contract for the structures and piping. The rapid mix equipment went to International Engineering, Inc.; the slow mix to Jeffrey Mfg. Co.; the filter equipment to Municipal Service Co.; and the pumping equipment, including one low lift, one high lift and one wash water pump, to Economy Pumps, Inc. Alvord, Burdict & Howson, of Chicago, are the consultants.

Principal features of the improvements and their relative cost are:

Bids: 4-22-52 Items	Total Cost	% of total	$ per mgd addition
Total	$573,431	100.0	$191,144
Structures & piping	463,000	81.0	154,333
Mixing equipment			
rapid mix	2,081	0.4	694
slow mix	8,021	1.0	2,674
Filter equipment	91,060	16.0	30,353
Pumping equipment	9,270	2.0	3,090

Outlet works for N. Y.'s East Delaware Tunnel

The final link in New York City's great Delaware Water Supply project, nears completion with the $1.6 million contract award this month for the outlet works for the 25-mi East Delaware Tunnel.

The principal parts of the outlet works consist of a substructure of a powerhouse, outlet chamber, stilling chamber, tail race, discharge channel, and a steel pipe conduit to connect with the powerhouse conduit and four by-pass pipes connecting the conduit with the outlet chamber.

Minimum wage rates per hour range from $1.87½ to $3.37½ for skilled labor; $1.60 to $2.75 for semi-skilled; and are $1.60 for unskilled.

Work began May 28, 1952 and must be complete February, 1955.

Bidders include:

1C	Booth & Flinn Co., Pittsburgh, Pa.	$1,808,570
2	Grow Constr. Co. Inc., New York, N. Y.	1,729,710
3	Walsh Constr. Co. & B. Perini & Sons Inc., New York (Joint Venture)	2,244,455

Bids: 4-29-52 Items	Unit	Quantity	Unit Price 1 C	2
Removal of soil	cy	500	$1.00	$1.00
Excavation, earth	cy	20,000	1.00	1.10
rock	cy	10,500	7.00	9.00
Refill & embank	cy	38,000	2.00	1.50
Surf dress & grass	cy	500	5.00	10.00
Timber & lumber	Mfbm	100	150.00	150.00
Concrete masonry	cy	11,000	46.30	41.00
Rubble masonry & paving	cy	650	30.00	80.00
Reinf conc culv pipes	lf	200	8.00	7.00
Vitr & asbestos cmt pipes	lf	1,000	2.00	2.00
Drill holes in rock or masonry	lf	200	2.00	2.00
Mix & place grout	cy	25	120.00	60.00
Crushed stone, gravel & sand	cy	700	8.00	7.00
Portland cement	bbl	20,000	4.00	5.00
Stl for reinf conc	lb	595,000	0.15	0.15
Structural steel	lb	98,000	0.14	0.15
Steel pipe	lb	295,000	0.45	0.70
Clad steel pipe	lb	145,000	1.10	1.20
Cast iron pipes & fittgs	lb	12,000	0.30	0.40
Misc cast iron, wrought iron & steel	lb	13,500	0.40	0.40
Galvanizing	lb	6,000	0.15	0.06
Articles of aluminum	lb	26,000	1.00	2.20
Misc bronze, brass & copper	lb	25,000	1.25	2.20
Wire fencing	lb	11,000	0.30	0.30
Caring for, instl & test equip & metal work furn by City	lb	375,000	0.20	0.08
furn by Rockland Light & Power Co.	lb	225,000	0.12	0.08
Chlorination	C month	60	80.00	100.00
Liquid chlorine	lb	10,000	0.12	0.30
Venturi meters	ea	1	$200.000	$217,000
Indicat& record instruments	ea	1	15,000	12,000
Sanitary services	ea	1	8,000	6,000
Cleaning up	ea	1	3,000	20,000

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BUILDINGS

LOW BIDS AND CONTRACTS

E. J. Pinney Co., Inc., 200 Dwight St., Springfield, Mass. CA Est. $400,000. elementary SCHOOL, Franklin Ave., WESTFIELD, MASS. City School Dpt., Dr. T. J. Abernathy, supt., Broad St., Westfield, Mass. CD 4/22, under LB.

Aberthaw Co., 80 Federal St., Boston, Mass. CA $750,000. meat packing PLANT, New Market area, ROXBURY, MASS. Columbia Packing Co., 155 Blackstone St., Boston, Mass. Bids June 4. CD 5/23.

† National Constr. Co., 767 E. Third St., South Boston, Mass. CA $619,520. remodel BUILDING 39, Watertown Arsenal, WATERTOWN, MASS. Purchasing & Contracting Office, Arsenal, Watertown, Mass. CD 5/9, under LB.

▲ H. V. Collins, 7 Dyer St., Providence, R. I. CA $1,220,504, Fox Point Elementary SCHOOL, Tockwotten Park, PROVIDENCE, R. I. City, Supt. Schools, 20 Summer St., Providence, R. I. Bids June 2, awarded June 10. CD 6/11. under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
July 8, Maryland July 18, Penncylvania
STREETS AND ROADS
July 1, Maryland July 3, New Jersey
July 9, Delaware July 10, New York
July 18, Pennsylvania

▲† Del., Dover—ROADS, SEEDING, etc.—B.A. after 8/13—Dpt. Army, 121 N. Broad St., Phila., Pa., roads, walks, seeding, grading, Dover Air Force Base, $1,000,000. Whiteside, Foster, Damon and Doane, Inc., Du Pont Bldg., Wilmington, engrs. and archts. CD 9/13/51.

▲ N. J., Fort Dix—B.A. 8/15—Dpt. Army, 121 N. Broad St., Phila., Pa., sewage treatment and disposal plant $1,000,000. Whitman, Requardt & Assocs., 1304 St. Paul St., Baltimore, Md., engrs.

BIDS ASKED—BUILDINGS

▲ N. Y., West Babylon—SCHOOL—B.A. 7/1—Bd. Educ., Educ. Union Free School Dist. 2, Great East Neck Rd. School, West Babylon, grade school, $1,100,000.

N. Y., Manhasset—TOWN HALL—B.A. 7/8—Bd. Supervs., Town of North Hempsted, Town Hall, Plandome Rd., town hall addn., alterations. $575,000.

▲† N. J., Fort Monmouth—LABORATORY—B.A. 7/30—U. S. Eng., 80 Lafayette St., New York, 13, N. Y. Signal Corps Research and Development Laboratory, $6,250,000. Plans deposit $80. CD 12/13/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEW JERSEY—State Hy. Dpt., Trenton,
Union Bldg. & Constr. Co., 631 Main Ave., Passaic, N. J. CA, $712,027, paving 1.79 mi. Route 4, Parkway from Galloping Hill Road to Route 29, Kenilworth and Union Twp., Union Co. Bids May 27, awarded June 10. CD 6/6, under LB.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Reid Contg. Co., Inc., Mutton Hollow Rd., Woodbridge, N. J., LB, $608,918, wid'n., resurf. 4.167 mi. Route 35 Sections 25-B and 34-D, Morgan and Keyport, Middlesex and Monmouth Counties. Bids June 17. CD 6/2.

NEW JERSEY—State Hy. Dpt., State Hy. Office Bldg., Trenton,
Arthur R. Henry, Inc., Northfield, N. J., CA, $532,894, constr. Hancock's Bridge over Alloways Creek, Salem Co. Bids May 20, awarded June 17. CD 5/23, under LB.

▲ Stamato & Cestone, 28 Main St., Lodi, N. J., LB $543,044, Contr. 2, sewers;
Carl L. Furner, Inc., 96 Kendall Blvd., Oaklyn, N. J. LB $582,508, Contr. 4, sewage treatment works, MORRISVILLE, PA. Municipal Auth. of Morrisville Boro, Boro Hall, Washington and Chambers Sts., Morrisville, Pa. Bids June 6. CD 5/15.

▲ Stamato & Cestone, 28 Main St., Lodi, N. J., LB $889,949, Contr. 1, sewers; LB $583,728, Contr. 3, sewers;
Dravo Corp., Neville Island, Pittsburgh, Pa., LB $159,430, Contr. 5, mechanical work in connection with Sewage Treatment Works, MORRISVILLE, PA. Municipal Auth. of Morrisville Boro, Boro Hall, Washington and Chambers Sts., Morrisville, Pa. Bids June 6. CD 5/15.

▲ C. J. Langenfelder & Son, Inc., 8427 Pulaski Hy., Baltimore, Md. LB $1,808,330, Alternate 1A $1,561,050, imprv. East Capitol St. Bridge, WASH., D. C. Dist. Columbia, Director Highways, District Bldg., 14 and E. Sts. N. W., Wash. 4, D. C. Bids June 18. CD 5/24.

▲ DELAWARE—State Hy. Dpt., Dover,
Wilson Contg. Co., State Road, Del., LB, $1,638,323, Alternate B, 7.956 mi. Delmar to Georgetown-Laurel Road, Contract 1149. Bids June 11. CD 5/26.

▲ E. & E. J. Pfotzer, P. O. Box 1074, Roanoke, Va., CA $2,781,880, sewage treatment plant, roads, walks, and site imprvs., WILMINGTON, DEL. Street & Sewer Dpt., City Hall, Wilmington, Del. Bids June 3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† Peter Reiss Constr. Co., Inc., 105 Court St., Brooklyn 2, N. Y. LB approx. $4,000,000. U. S. Army INSTALLATION, Plum Island, NEW YORK, U. S. Eng., 80 Lafayette St., New York 13, N. Y.

Carnoy-Wolter Constr. Corp., 55 Tarrytown Rd., White Plains, N. Y. Owner Builds. Approx. $500,000. 35 HOUSES on Knollwood Heights' sect. near Knollwood Rd., GREENBURGH, N. Y. Henry H. Moger, Jr., 250 Main St., White Plains, N. Y., archt.

William Kaufman, 342 Madison Ave., New York 17, N. Y. Owner Builds. Approx. $500,000. 7 story Pan American AIRWAYS BLDG., 28-19 Bridge Plaza North, LONG ISLAND CITY, N. Y. Herbert Tannenbaum, 205 E. 43 St., New York 17, N. Y., archt.

▲ Knolls Co-operative, Inc., 1775 Broadway, New York, N. Y. Owner Builds. Approx. $1,590,000. two 10-story APARTMENTS, Henry Hudson Parkway and Kaupock St., NEW YORK, N. Y. S. J. Kessler, 118 E. 28 St., New York 16, N. Y., archt.

▲ Lenard Ranch Homes, c/o John Burton Assoc., archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. $1,750,000. 85 HOUSES on 20-acre tract on Central Ave. and Wells Rd., VALLEY STREAM, N. Y.

James Mitchell, Inc., 75 Montgomery Ave., Jersey City, N. J. LB, $725,000, State HOSPITAL for Senile Patients, TRENTON, N. J. N. J. Dept. Purchases & Property, 319 State House, Trenton, N. J. Bids June 12.

Massett Bldg. Co., 1516 Atlantic Ave., Atlantic City, N. J. LB, $464,426, Junior High SCHOOL, VINELAND, N. J. Vineland-Landis Twp. Bd. Educ., Vineland, N. J. Bids June 2. CD 5/15.

▲ John H. Wickersham Engineering & Construction Co., Inc., 145 Locust St., Lancaster, Pa., LB, Approx. $1,887,500, HOSPITAL, LANCASTER, PA. St. Joseph's Hospital, 202 College Ave., Lancaster, Pa. Bids June 12. CD 5/7.

Wark & Co., 1920 Sansom St., Phila., Pa., LB, $548,000. NURSES RESIDENCE and BOILER HOUSE, NORRISTOWN, PA. Montgomery Hospital, Norristown, Pa. Bids June 5. CD 5/16.

Wark & Co., 1920 Sansom St., Phila., Pa., CA. $500,000. DISPENSARY and INDUSTRIAL RELATIONS BLDG., MORRISVILLE, PA. U. S. Steel Co., 434 5th Ave., Pittsburgh, Pa. Hoffman & Crumpton, Century Bldg., Pittsburgh, Pa., archts.

Wark & Co., 1920 Sansom St., Phila. Pa., CA. $500,000. General OFFICE bldg., MORRISVILLE, PA. U. S. Steel Co., 434 5th Ave., Pittsburgh, Pa. Hoffman & Crumpton, 130 7th St., Pittsburgh, Pa., archts. CD 10/22.

▲ Costanza Constr. Co., 6515 Crescent Blvd., Pennsauken, N. J., LB $1,011,900, HIGH SCHOOL, paving and water mains, NESHAMINY, PA. Neshaminy Joint School Bd., Langhorne, Pa. Walker Yeomans, Inc., 117 S. 17 St., Phila: Pa., engr. CD 2/1.

▲† Standard Constr. Co., Inc., 1010 Vermont Ave. N. W., Wash., D. C., LB $1,996,787, Plastered Wall Finish $1,945,787, Dry Wall Finish; Richardson Dwellings Housing, Proj. DC-1-17, Clay and 53 Sts. N.E., WASH., D. C. National Capitol Housing Auth., 1728 L St. N.W., Wash., D. C. Bids June 17. CD 5/27.

▲ J. Frank Darling, Wawaset Apartments, Wilmington, Del., Separate Contracts, $9,000,000, 900 RESIDENTIAL DEVELOPMENT, Swanwyck Sections, NEW CASTLE, DEL.

▲ Anthony P. Miller, 3333 Arctic Ave., Atlantic City, N. J., LB, $1,706,000, Southbridge HOUSING development, WILMINGTON, DEL. Wilmington Housing Auth., 1302 Thatcher St., Wilmington, Del. Bids June 5. CD 5/1.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
July 9, Louisiana
STREETS AND ROADS
July 2, Florida July 3, Kentucky
July 9, Louisiana

BIDS ASKED—BUILDINGS

S. C., North Charleston—HIGH SCHOOL—B.A. 7/2—School Dist. 4, North Charleston, Negro High School, $627,400. Halsey & Cummings, 4 Broad St., Charleston, archts. CD 5/7.

▲ W. Va., Alloy—PLANT—Bids Asked—Electro Metallurgical Co., Div. Union Carbide & Carbon Corp., Alloy, W. Va., chemical plant addn., Est. $1,000,000.

SOON LETS CONTRACT—BUILDINGS

▲ N. C., Swannanoa—PLANT—Oelikon Tools & Arms Corp., c/o Six Associates, Inc., archt., 1025 Hendersonville Rd., Asheville, soon lets contract Phase 2, munitions mfg. plant. $3,000,000. CD 5/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† M. R. Thomason, Bell Bldg., Montgomery, Ala., CA, $750,315 site preparation, roads, drainage, ENG 09-133-52-50, FORT BENNING, GA. U. S. Eng., Post Office Bldg., Savannah, Ga. Bids May 13. CD 5/2.

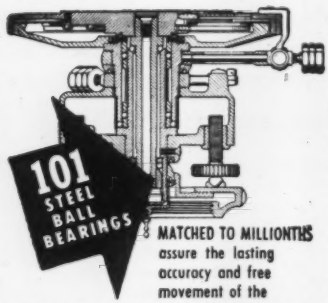
† Wesley Constr. Co., 174 Alexander St. N. W., Atlanta, Ga. CA, $500,536, 35th Air Division Facilities at Dobbins Air Force Base, Inv. 52-88, MARIETTA, GA. U. S. Eng., Post Office Bldg., Savannah, Ga. Bids May 29. CD 5/17.

† J. Hilbert Sapp, West Palm Beach, Fla., CA, $784,054, missile shops, interiors and misc. utilities Patrick Air Force Base, Inv. 52-150, COCOA, FLA. U. S. Eng., P. O. Box 970, Jacksonville, Fla. Bids May 28. CD 6/13, under LB.

Anderson Bros. Corp., 6300 Navigation Blvd., Houston, Tex. CA $700,000. 75 mi. gas lines from Greeneville, Tenn. to Drew, Miss., etc., MISSISSIPPI and TENNESSEE. Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex. CD 8/29/47 under Louisiana, Texas, Mississippi and Arkansas.

▲ LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge,
Sam Finley, Inc., 292 N. Ave., Atlanta, Ga. CA $558,163. patching, wid'n. c. conc. pavement, surf. with bit. wearing course 10.631 mi. Iowa-Welsh Hy., State Rte. No. 2, S.P. 3-06-09, 3-06-08 and 3-07-06, Jefferson Davis Parish. Bids May 7, awarded May 8, CD 5/14, under LB.

Texas Bitulithic Co., Box 8044, New Orleans, La. CA $658,636. patching, wid'n. c. conc. pavement, thin-



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teen 20 ft., four 20 ft. concrete slab span bridges 11.79 mi. Arcadia-Gibsland Hy., State Rte. 4, S.P. •1-06-14, Bienville Parish, Bids Apr. 16, awarded May 1, CD 4/23 under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Frankfort, Curtis Cantrill, Middlesboro, Ky. CA $99,784. 3 in. bit. macad. surf. 6.9 mi., SP 98-263, Pike Co.;
Franklin Constr. Co., 315 High St., Frankfort, Ky. CA $68,201. bit. surf. Class C-1 7.953 mi., SP 98-123, 98-623, Pike Co.;
R. E. Gaddie, Inc., Bowling Green, Ky. CA $80,307. rock asph. surf. 17.981 mi., SP 70-70, 28-126, Livingston and Crittenden Counties;
Ellis, Kelly & Co., Owensboro, Ky. CA $104,961. bit. surf. Class C-1 13.393 mi., SP 117-309, 117-369, 117-549, Webster Co.;
Corum & Edwards, Inc., Madisonville, Ky. CA $74,561. bit. surf. Class F 9.1 mi., SP 54-100, 54-60, Hopkins Co.;
Kentucky Road Oiling Co., Frankfort, Ky., CA $59,772. bit. surf. Class C-1 6.5 mi. SP 77-60, Magoffin Co.; CA $110,023. traffic bound limestone 2.982 mi. Wrigley-Leisure Rd S 367 (1), SP 88-158, SP 88-358, Morgan Co.;
G. & R. Coal Co., Robbins, Tenn. CA $132,454. traffic bound limestone 3.833 mi., Edmonton-Breeding Rd., S 137 (2), SP 85-144, Metcalfe Co.;
State Contg. & Stone Co., Hartford, Ky. CA $66,801 bit. surf. Class I limestone aggregate 7.132 mi. SP 46-37, Hancock Co.;
Licking River Limestone Co., West Liberty, Ky. CA $60,471. reconstr. traffic bound limestone 3.316 mi. Cooks Branch-Cane Ridge Rd., RS 87-337, RS 99-280, Montgomery and Powell Counties;
Sam Nally & Co., Bardstown, Ky. CA $165,698. reconstr. traffic bound river grav. 7.353 mi. Ewingsford-Carroll Co. line road, RS 112-158, RS 21-272, Trimble and Carroll Counties;
Robert M. Robinson, Owensboro, Ky. CA $107,491. bit. surf. Class C-1 15.13 mi., SP 24-165, 24-405, 24-625, Christian Co.;
Greer Bros. & Young, London, Ky. CA $66,363. reconstr. traffic bound limestone 5.188 mi. and 3.56 mi., Slate Lick Creek Rd., RS 62-101 and RS 63-751, Laurel Co.;
Wm. M. Hooper, Caneyville, Ky. CA $62,985. reconstr. traffic bound limestone 4.965 mi. and 2.739 mi. Columbia-Knifley Rd., RS 1-410 and RS 1-490, combination Adair Co. Grand total $1,260,772. Bids June 6.

† **R. P. Farnsworth & Co.**, 1515 S. Salcedo St., New Orleans, La., CA, $822,901, concrete and steel floodwall along Memphis Waterfront, Wolf River, Shelby Co., CIVENG 40-014-52-100, TENNESSEE. U. S. Eng., P. O. Box 97, Memphis, Tenn. Bids June 10. CD 6/16.

† **Helrich Constr. Corp.**, 2100 Ailor Ave., Knoxville, Tenn. LB $868,349, Item 1; $907,279, Item 2, for maintenance hangar, dormitories, warehouse, etc. at McGhee-Tyson Air Force Base, Inv. 52-22, KNOXVILLE, TENN. U. S. Eng., 303 Federal Office Bldg., Nashville 1, Tenn. CD 5/20.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bush Constr. Co.**, Flat Iron Bldg., Norfolk, Va., LB $1,988,889, construct, manage, finance, APARTMENT units, Inv. 52-38, FORT MONROE, VA. U. S. Eng., foot of Front St., P. O. Box 119, Norfolk, Va. Bids June 10. CD 5/21.

▲† **Southeastern Constr. Co.**, Peoples Bldg., Charleston, W. Va., CA, $2,494,869, EXPERIMENT STATION, MORGANTOWN, W. VA. Bureau of Mines, Dpt. Interior, Morgantown, W. Va. Bids May 27. CD 6/11, under LB.

▲ **Cecil's, Inc.**, Spartanburg, S. C., CA, $1,423,387, 247 units HOUSING, Proj. NC 13-2, DURHAM, N. C. Durham Housing Auth., Durham, N. C. Bids June 12. CD 4/23.

▲† **Coble Contg. & Engineering Co.**, Box 2040, Greensboro, N. C., CA, $5,393,000. 12 quartermaster WAREHOUSES, NOY 70682, CAMP LEJEUNE, N. C. Dpt. Navy, Officer in Charge of Consturction, Box 365, Naval Base, Charleston, S. C. Bids May 29. CD 6/3, under LB.

▲ **Fayetteville Building Co.**, Fayetteville, N. C. CA Approx. $2,000,000. 376 HOUSING units, FAYETTEVILLE, N. C. Eutaw, Inc., c/o contractor.

McGhee Bamberg, Bamberg, S. C., Owner Builds. $500,000. RESIDENCES, BAMBERG, S. C.

Cecil's, Inc., Spartanburg, S. C., CA, $927,000, HOUSING units, GAFFNEY, S. C. Gaffney Housing Auth., Gaffney, S. C. Bids June 11. CD 6/18, under LB.

S. J. Curry & Co., Albany, Ga., LB, $927,927 HOSPITAL, BRUNSWICK, GA. City, Brunswick, Ga. Bids June 13. CD 5/23.

▲† **Claussen & Webster**, 1394 Gwinnett St., Augusta, Ga., CA, $1,829,967, BARRACKS, CLASSROOMS and WAREHOUSES, CAMP GORDON, GA. U. S. Eng., P. O. Box 889, Savannah, Ga.

Williams Constr. Co., 1032 13 St., Columbus, Ga., CA $503,500, Y.M.C.A. BLDG. addn., COLUMBUS, GA. Young Mens Christian Assn., 118 E. 11 St., Columbus, Ga. Bids May 15. CD 5/23, under LB.

Winchester Constr. Co., 828 Baker St., Tallahassee, Fla. LB, $856,000, Male and female WARDS at Florida State Hospital, CHATTAHOOCHEE, FLA. Florida State Improvement Comn., Caldwell Bldg., Tallahassee, Fla. Bids June 12. CD 5/26.

▲ **Mrs. Herbert Hoppe**, c/o Pamorrow Turner, archt., 620 N.E. 127 St., Miami, Fla., Owner Builds $1,000,000 118 RESIDENCES, FORT LAUDERDALE, FLA.

▲ **J. Y. Gooch Co., Inc.**, 1205 Congress Bldg., Miami, Fla., CA, $1,000,000, HOSPITAL, MIAMI, FLA. North Shore Hospital, 8037 N.E. 2 Ave., Miami, Fla.

Shelby Constr. Co., 1106 Canal St., New Orleans, La., CA, $619,063, HOUSING units, SARASOTA, FLA. Sarasota Housing Auth., Sarasota, Fla. Bids June 10 CD 6/16, under LB.

▲ **Shelby Constr. Co.**, 1106 Canal St., New Orleans, La., CA, $2,779,620, 390 HOUSING units, MONTGOMERY, ALA. Montgomery Housing Auth., Bell St., Montgomery, Ala. Bids June 12. CD 6/18, under LB.

▲ **Kaiser Engineers div. Kaiser Industries, Inc.**, 1924 Broadway, Oakland, Calif. CA total est. cost $3,000,000. PLANT, VICKSBURG, MISS. Westinghouse Electric Corp., 1370 Ontario St., Cleveland, O. CD 6/17.

▲ **Logan, Johnman & Wilson Co.**, Bossier City, La. Owner Builds. $3,000,000. 240 HOUSING Units, MONROE, LA.

Gentilly Homes, 4210 Press Dr., New Orleans, La. Owner Builds. $550,000. 78 RESIDENCES, NEW ORLEANS, LA.

James S. Reily Co. & John B. Greer Jr., Ricou-Brewster Bldg., Shreveport, La. Owner Builds. $750,000. RESIDENCES, SHREVEPORT, LA.

▲ **Foster & Creighton Co.**, American Natl. Bank Bldg., Nashville, Tenn., LB, $1,306,800. STUDENT ACTIVITIES Bldg., KNOXVILLE, TENN. University of Tennessee, Administration Bldg., Knoxville, Tenn. Bids Apr. 15. CD 3/24.

J. W. Pillay, 1st Natl. Bank Bldg., Memphis, Tenn. Own Forces. $400,000. 36 unit HOUSING. MEMPHIS, TENN. Daggitt & White, Medical Art Bldg., Memphis, Tenn., archts.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Mahoney Contg. Co., 2300 N. Grand River, Lansing, Mich. CA, $625,000, 14 mi. high pressure gas transmission pipe line between Carroll, Fairfield Co. and Columbus, Franklin Co., final sect. of 47 mi. sys. to bring gas directly to Columbus from Benton underground storage fields in Hocking Co.;
Robert Stanley Pipeline Constr. Co., Mt. Vernon, O., CA. $145,100, 2 mi. 20 in. distr. lines from the Fairwood Ave. station to the Marion Rd. Station, Columbus; Own Forces. $80,340, expansion of Fairwood Ave. station, incl. added facilities for regulating, measuring and cleaning gas, OHIO. Ohio Fuel Gas Co., N. Front St., Columbus, O. Grand total $850,440. CD 6/21/49.
Gallagher & O'Horo, Inc., 3130 Belmont Ave. Exten., Youngstown, O., CA $979,552, 2 new settling basins, repair and imprv. 2 old basins at its Mineral Ridge water plant, YOUNGSTOWN, O. Mahoning Valley Sanitary Dist., Box 298, Youngstown, O. Bids June 10. CD 5/29.
MICHIGAN—State Hy. Comn., 222 Townsend St., Lansing, Zone 13.
Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich. CA, $580,050, est. $600,000. concrete paving 5.317 mi. M-46 and M-19, F 74-18 C4 (F 414 4) M 74-20 C4, M 74-37 C3 Sanilac Co.;
Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich., and **Wm. J. Muehlenbeck**, 253 S. Water St., Saginaw, Mich. CA, $887,751. 8 and 9 in. dual c. conc. 7.022 mi. US-127, F 35-54 C2 (F 146 7) Part I, F 33-75 C1 (F 146 7) Part 2, Ingham Co. CD 6/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Aluminum Co. of America**, 2210 Harvard Ave., Cleveland, O. Own Forces and Separate Contracts. Approx. $1,280,000 5 story brick STORAGE bldg., CLEVELAND, O.

▲ **Clifford Building Co.**, 3896 W. 117 St., Cleveland, O. Owner Builds. Approx. $1,500,000. 150 frame HOUSES, Brooklawn and Summerland Aves. and adjoining area near W. 130 St., CLEVELAND, O. Carl Apicella, 4302 Prasse Ave., Cleveland, O., archt.

▲ **Peter Schumacher & Son**, 321 S. Spring St., Mishawaka, Ind., LB, $1,290,228, 2 brick, rein.con. DORMITORIES for Aged addn., Norman Beatty State Hospital, WESTVILLE, IND. State of Indiana, P. Wks. & Supply Div., W. R. Mybeck, State House, Indianapolis, 4, Ind. Bids June 10. CD 5/14.

The Kinnare Corp., 3816 W. Monroe St., Chicago, Ill., CA, $425,000, 2 and 3 story, 30,000 sq. ft. SCHOOL, CHICAGO, ILL. St. Denis Parish, St. Louis and 83 Sts., Chicago, Ill. Bids May 20. CD 5/7.

Erik A. Borg, 6649 N. Ridge Ave., Chicago, Ill., CA, $688,300, 9 story, rein.-con., brick STUDENT and FACULTY APARTMENT BLDG., CHICAGO, ILL. Illinois Institute of Technology, 32 and Wabash St., Chicago, Ill. Bids Apr. 30. CD 5/12, under LB.

▲ **Twin Improvement Corp.**, 180 W. Randolph St., Chicago 1, Ill., Owner Builds, $1,100,000, 130 HOMES, DES PLAINES, ILL. Carl Kastrup, 7346 Madison Ave., Forest Park, Ill., archt. Awarded June 11.

Cream City Constr. Co., 744 N. 4 St., Milwaukee, 3, Wis., CA, $750,000, 1 story, 64x200 ft., 180x220 ft., 30x180 ft., 10x260 ft., concrete blocks, steel FACTORY, MILWAUKEE, WIS. International Trading Co., 744 N. 4 St., Milwaukee, 3, Wis. R. Jacobs & A. P. Rugg, 3344 N. 39 St., Milwaukee, 16, Wis., engrs. and archts.

Matthew Lalewicz, 3623 Caniff St., Hamtramck, Mich. CA, $446,304. 2 story, bsmnt., brick, steel Columbus SCHOOL, 18025 Brock St., DETROIT, MICH. City, Bd. Educ., Detroit, Mich. Bids May 19. CD 5/5.

Farnham Homes, 6919 Archdale St., Detroit, Mich. Owner Builds. **$900,000.** 100 brick frame HOUSES, West Warren and Southfield Rds., near Dearborn Line, DETROIT, MICH.

▲ **Miller Homes, Inc.,** 13535 Livernois St., Detroit, Mich. Owner Builds. **$5,000,000.** brick, single HOMES, Golfhurst Section, Beverly Hills, DETROIT, MICH. CD 1/30.

C. Bruton Realty Co., 15100 Fenkell St., Detroit, Mich. Owner Builds. **$875,000.** 80 brick, single frame HOUSES, Helmandale Dr., Rushmore Circle, Birchway Dr. and Telegraph Rd., FRANKLIN, MICH.

▲ **Northern Development Co.,** David Fuller, pres., Hazel Park, Mich. Owner Builds. **$1,500,000.** COMMERCIAL CENTER, incl. stores, trailer park, light mfg. plants, 10 Mile and Dequindre Rds., HAZEL PARK, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 1, Iowa July 2, Kansas

▲ **Mo., St. Louis County**—B.A. About 7/20—St. Louis County Water Co., W. Victor Weir, pres., 6600 Delmar Blvd., University City, Zone 5, superstructure of addn. to filter plant and pumping facilities, etc. at water works plant on Missouri River near Hog Hollow Road. Total est. $1,500,000.

BIDS ASKED—BUILDINGS

Minn., Red Wing—SCHOOL—B.A. 7/10—Bd. Educ., Special School Dist. 1, A. Hernlem Jr., clk., high school. $500,000. Plans deposit $20. Toltz ing & Day, 1501 Pioneer Bldg., St. Paul, archts. CD 12/20/51.

Tex., Brownsville—MEMORIAL CENTER—B.A. 7/31—Fort Brown Memorial Center, c/o City of Brownsville, Brownsville, Ft. Brown Memorial Center. $500,000. Wiltshire & Fisher, 4703 Ross Ave., Dallas, archts. CD 7/5.

▲ **Ia., Davenport**—HOSPITAL—B.A. 7/22—Mercy Hospital, 1326 Lombard St., hospital addn. $2,100,000. CD 11/13/51.

▲ **Tex., San Angelo**—TURBO-GENERATOR—Bids Asked—West Texas Utilities Co., Abilene, turbo-generator electric power plant unit. $3,954,000. CD 9/25.

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul,

Megarry Bros., St. Cloud, Minn. GA, **$289,670.** plant-mixed bit. surf. 8 mi. between Duluth and Pike Lake, St. Louis Co.;

S. J. Groves & Sons Co., 510 Wesley Temple Bldg., Minneapolis, Minn. CA **$430,721.** concrete base, plant-mixed bit. surf. 8.4 mi. between Jct. TH 65 and TH 10 and 3 mi. north of Johnsville, Anoka Co.;

Fischer Constr. Co., Farmington, Minn. CA, **$132,163.** grav. base, plant-mixed bit. surf. 11 mi. between Jasper and Pipestone, Pipestone Co.;

McCree & Co., 918 New York Bldg., St. Paul, Minn. CA, **$247,891.** grav. base, plant-mixed bit. surf. 17.9 mi. between Ivanhoe and 5 mi. west of Marshall, Lincoln and Lyon Counties;

C. L. Nelson Co., Brainerd, Minn. CA, **$484,073.** grav. base, plant-mixed bit. surf. 25.1 mi. between north Jct. TH 1 and Jct. 71 in Big Falls, Itasca Co.;

Barton Contg. Co., 3115 Hennepin Ave., Minneapolis, Minn. CA, **$116,986.** grav. base, plant-mixed bit. surf. between Faribault and Kasson, Goodhue Co.;

R. Benson & Sons, Stephen, Minn. CA, **$258,139.** grading, grav. base 10.5 mi. between Brooks and East Red Lake Co. line, Red Lake Co.;

Nelson, Mullen & Nelson, 355 Gateway Bldg., Minneapolis, Minn. CA, **$264,448.** grading 8.1 mi. between Motley and Pillager, Cass Co. Grand total $2,223,-291. Bids June 6. CD 5/22.

▲ **IOWA**—State Hy. Comn., Ames,
Booth & Olson, Inc., 529 Insurance Exchange Bldg., Sioux City, Ia. LB, **$237,444,** paving 1.245 mi. U-781 (8), Appanoose Co.; LB, **$559,144;** pavement wid'n. resurf. 7.953 mi., F 203 (6), Boone and Greene Counties;

Central Constr. Co., Indianoal, Ia. LB, **$546,807,** paving 10.472 mi., FN 5, Butler Co.;

Fred Carlson Co., Decorah, Ia. LB, **$367,489,** paving 6.856 mi., F-888 (4), Cerro Gordo Co.;

Hallett Constr. Co., Crosby, Minn. LB, **$377,166,** pavement wid'n., resurf. 15.73 mi., FN-57, Cedar Co.;

Ronald Kenyon Co., 325 59 St., Des Moines, Ia., LB, **$343,021.** pavement wid'n., resurf. 6.334 mi. FN-246, Wapello Co.; LB, **$124,869,** grading 6.334 mi. FN-246, Wapello Co.;

Lee & Johnson, 215 Insurance Exchange Bldg., Sioux City, Ia. LB, **$239,281.** stabilized base, bit. surf. 8.746 mi., F-905 (2), Dickinson Co.;

Cameron, Joyce & Co., Keokuk, Ia. LB, **$146,746.** stabilized base bit. surf. 4.63 mi. S-1864 (1), Louisa Co.;

Braden Constr. Co., Griswold, Ia. LB, **$92,434.** grading 4.451 mi., FN-925, Adams Co.;

Ralph Green & W. L. Groesbeck, 312 Masonic Temple Bldg., Des Moines, Ia., LB, **$112,165.** grading 7.451 mi., FN-951, Clay Co.; LB, **$149,240.** grading 7.362 mi., FN-815, Lee Co.;

M. L. Johnson, 112 32 St. S.E., Cedar Rapids, Ia., LB, **$62,859.** grading 2.668 mi. S-1307 (2), Dubuque Co.;

Lowe Constr. Co., 21 St. and 6 Ave., Marion, Ia. LB, **$282,232.** grading 12.035 mi. FN-168, Fayette Co.;

Ira Van Buskirk & Sons, Hawarden, Ia. LB **$86,382.** grading 7.887 mi., FN-269, Sioux Co. Bids June 17. CD 6/4.

St. Louis County Water Co., W. Victor Weir, pres., 6600 Delmar Blvd., University City 5, Mo. Own Forces. constr. 3 mi. 36 in., 4½ mi. 30 in. trunk water line from Hog Hollow Rd. pumping station on Missouri River to connect with existing mains on Fee Fee Rd. at Olive St. Rd.;

Lock Joint Pipe Co., Turner, Kan. CA, furnishing pipe. ST. LOUIS COUNTY, MO. Total est. **$450,000.**

▲ **St. Louis County Water Co.,** W. Victor Weir, pres., 6600 Delmar Blvd., University City 5, Mo. Own Forces. **$524,000.** 4½ mi. 20 and 36 in. from point near Fee Fee and Olive St. roads to Lindbergh Blvd.; **$2,000,000** addnl. 6- to 16-in. distr. mains in various sections, ST. LOUIS COUNTY, MO.

Houston Contg. Co., 2707 Ferndall Pl., **Houston, Tex. CA $750,000.** 131 mi. gas lines from Jasper, Tex. to Edora, Ark., ARKANSAS, LOUISIANA and TEXAS. Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex. CD 8/29/47, under Louisiana, Texas, Mississippi and Arkansas.

† **J. B. Mayfield,** Box 720, Burleson, Tex., CA. **$546,112.** drainage structures, and excavation of channel, Part III, Fort Worth Floodway, Trinity River and Tributaries, Inv. No. CIVENG 41-443-52-52, TEXAS. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids May 20 CD 5/27, under LB.

† **H .B. Zachry Co.,** Box 3570, San Antonio, Tex., LB **$697,909,** runway and taxiway exten. over 145,695 sq. yd. 3 in. b. conc. surf. Bergstrom Air Force Base, Inv. No. ENG 41-243-52-110, AUSTIN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids June 13. CD 5/21.

▲† **Brown & Root, Inc.,** Box 3, Houston, Tex., CA **$2,642,547.** Parallel Runway 13-31, Taxiways and drainage, Contr. NOY 71643, CORPUS CHRISTI, TEX. U. S. Govt., Officer in Charge of Construction, Naval Air Advanced Training Command, Naval Air Station, Corpus Christi, Tex. Bids Apr. 9. CD 4/16, under LB.

† **E. B. Darby & Co.,** Box 467, Pharr, Tex., CA. **$565,065.** apron exten. at Harlingen Air Force Base, Inv. No. Eng. 41-243-52-35, HARLINGEN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids June 4, awarded June 14. CD 6/18, under LB.

▲† **Powell, Samani & Carruth,** Gatesville, Tex., LB, **$1,118,621,** est. $1,231,421, misc. type shop bldgs. at Wolters Air Force Base, Inv. No. Eng. 41-443-52-48, MINERAL WELLS, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids June 17. CD 5/26.

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▲ **Brown & Root, inc.**, 4100 Clinton Dr., Houston, Tex., CA. Total est. **$73,000,000.** design and construct PLANT for synthetic organic chemicals and plastic resins, SEADRIFT, TEX. Carbide & Chemicals Div., Union Carbide & Carbon Corp., Texas City, Tex. CD 2/19.

MONTANA—State Hy. Comn., Capitol Bldg., Helena,
Albert Lalonde Co., Sidney, Mont. LB **$368,846.** grav., oiling, draining 13.45 mi. Wolf Point north road in Roosevelt Co.;
S. Birch & Sons Constr. Co., Ford Bldg., Great Falls, Mont. LB **$151,021.** grav. 12.7 mi. Wolf Point north road, Roosevelt Co. Bids June 11. CD 2/19/43.

COLORADO—State Hy. Dpt., Denver,
Colorado Constructors, Inc., 725 W. 39 Ave., Denver, Colo., CA, **$577,769,** est. **$563,726,** grading, stabilization, structures, road mix oil surf. 1.24 mi. State Hy. 141, Uravan and Naturita, Montrose Co. Bids Apr. 24, awarded Apr. 28. CD 4/29, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Kucharo & Assocs., 225 Jewett Bldg., Des Moines, Ia., CA. **$347,000,** elementary SCHOOL;
Lippert Bros., Boone, Ia., CA, **$473,475,** elementary SCHOOL, MARSHALLTOWN, IA. Bd. Educ., Marshalltown, Ia. Bids June 10. CD 3/17.

▲ **Henkel Constr. Co.**, Mason City, Ia., CA, **$1,400,000** Soybean Processing PLANT, MASON CITY, IA. North Iowa Co-operative Processing Assn., Manly, Ia. CD 1/14.

▲† **Universal Constr. Co.**, Scarritt Bldg., Kansas City, Mo. CA **$1,374,174,** shell assembly unit, 15 supporting bldgs., 1 mi. roads, 2,400 ft. railroad, 2,000 ft. sidewalk, Lake City Arsenal, Inv. 52-42, INDEPENDENCE, MO. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids Apr. 8, awarded Apr. 10. CD 4/23, under LB.

▲ **Carl C. Wilson, Inc.**, 918 City Natl. Bank Bldg., Omaha, Neb., Owner Builds. Approx. **$1,000,000.** 114 DWELLINGS, in vicinity of 40 and Blondo Sts., OMAHA, NEB.

▲ **Huddleston-Seamon Co.**, Kingsville, Tex., CA. **$1,024,000.** construct, manage, finance 129 unit Wherry HOUSING, FHA Proj. No. 112-80004-Navy-1, NY-23-54, at Grand Prairie Air Station, DALLAS, TEX. U. S. Govt., c/o Dist. P. Wks. Office, Eighth Naval Dist., Bldg. 16, New Orleans 12, La. Bids Apr. 22. CD 4/29, under LB.

Coastal Constr. Co., 1201 N. Post Oak St., Houston, Tex. CA. **$600,000.** Bauxite RECEIVING DOCK of over 700 lin. ft. long, GREGORY, TEX. Reynolds Metals Co., Hunt Bldg., Gregory, Tex. J. Gordon Turnbull, Inc., 2630 Chester St., Cleveland, O., engr.

Harold P. Hill, 6408 Park Terrace Blvd., Houston, Tex. Owner Builds. **$310,000.** 40 DWELLINGS, HOUSTON, TEX. Mat Harwood, c/o owner, archt. CD 7/5.

Sims Bayou Constr. Co., 4100 DeLeon St., Houston, Tex., CA. Approx. **$392,500,** 38 DWELLINGS, HOUSTON, TEX. W. G. Lowery, 4100 DeLeon St., Houston, Tex.

▲ **U. S. Eng.**, 1127 Texas and Pacific Bldg., Fort Worth, Tex., cancelled bids to have been opened Mar. 19, construct, manage and finance 1,000 HOUSING units at Camp Wolters Air Force Base, Inv. NO. Eng 41-443-52-10. MINERAL WELLS, TEX. Will re-advertise. CD 3/14.

▲ **Brown-Schrepferman & Co.**, 240 Washington St., Denver, Colo., general contract;
Denver Plumbing & Heating Co., 1810 Blake St., Denver, Colo., plumbing and heating;
Jussel Elec. Co., 2611 W. 6 Ave., Denver, Colo., electrical work;
Westinghouse Electric Corp., G and E Bldg., Denver Colo., electrical work, 3 story, 90,000 sq. ft., department STORE to be known as Colodeh Moor Shopping Center, E 1 Ave. and University Blvd., DENVER, COLO. Buell Development Corp., 730 14 St., Denver, Colo. Total est. **$1,000,000.** Bids May 18. CD 4/22.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 9, 10, California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Maschinenfabrick B. Maier K. G.**, Brackwede, West Germany, LB, **$1,385,810,** four 39,000 hp hydraulic turbines for Palisades Power Plant Palisades Proj. Spec. DS 3706, IDAHO. Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. Bids June 10. CD 5/7.

▲† **Peter Kiewit Sons' Co.**, 442 Post St., San Francisco, Calif., CA. **$2,259,762.** addnl. aviation facilities at Naval Auxiliary Landing Field, NOY 72364, Spec. 32781, FALLON, NEV. P. Wks. Office, Twelfth Naval Dist., San Bruno, Calif. Bids May 28, awarded June 13. CD 6/5, under LB.

Young & Smith Const. Co., Beason Bldg., Salt Lake City, Utah, CA. **$312,404,** street, road work, 10.47 mi. paving, curbs, etc. Dist. 100-16;

J. M. Murphy Constr. Co., 701 W. Bonanza St., Las Vegas, Nev., CA. **$252,772,** paving, construct curbs, gutters, sidewalks, Dist. 100-17, LAS VEGAS, NEV. City, City Hall, Las Vegas, Nev. Bids June 11, awarded June 13.

▲ **Kansas City Bridge Co.**, 928 Broadway, and **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. CA. Approx. **$1,900,000.** remodeling and raising bridge over Columbia River between Pasco and Kennewick, WASHINGTON. Nortern Pacific Ry. Co., B. Blum, c. engr., 176 E. 5 St., St. Paul, Minn. CD 2/16/51.

McCormack Constr. Co., 128 S.E. 1st St., Pendleton, Ore., CA, **$167,944,** air terminal bldg., PENDLETON, ORE. City, City Hall, Pendleton, Ore. Charles Miller, Bond Bldg., Pendleton, Ore., archt. Awarded June 10.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,
Tumblin Co., 1700 19 St., Bakersfield, Calif., LB, **$190,717,** rein.-con. bridge 0.6 mi. road work approaches across Merced River at Cos Ferry, Merced Co.;
Ukropina, Polich & Kral, P.O. Box 425, Baldwin Park, Calif., LB, **$71,944,** bridge across West Sacramento Freeway at 3 St. west of Tower Bridge, near Sacramento, Yolo Co. Bids June 11. CD 5/21.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Peter Kiewit Sons' Co., 442 Post St., San Francisco, Calif., LB, **$2,552,500,** grading, surfacing, constr. separation structures 1.5 mi. Eastshore Freeway near Sahby Ave., Oakland and Berkeley, Alameda Co.;
Ball & Simpson, 685 Delaware St., Berkeley, Calif., LB, **$202,779,** grading, etc., 6.4 mi. between Glacier Lodge and 4.0 mi. west of Big Pine, Inyo Co.;
Harms Bros., 5261 Stockton Blvd., Sacramento, Calif., LB, **$140,066,** plant mix surf. 9.8 mi. between Lassen Co. line and Eagleville, Modoc Co.;
C. W. Peterson, 6856 Vantage Ave., North Hollywood, Calif., LB, **$178,537,** seal coating 2.2 mi. between Auburn and North Fork American River Bridge, Placer and El Dorado Counties. Bids June 11. CD 5/21.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,
Chas. MacClosky Co., 112 Market St., San Francisco, Calif., LB, **$746,708,** 8 rein.-con. bridges on Ramona Freeway between Los Angeles Co. line and Rt. 192, San Bernardino Co. Bids June 12. CD 5/21.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,
A. Teichert & Son, Inc., P. O. Box 1113, Sacramento, Calif., CA, **$508,216,** complete road contract north city limits of Los Angeles to Pico Canyon Rd., Los Angeles, Los Angeles Co. Awarded June 12. CD 6/10, under LB.

† **Fred J. Early Jr. Co., Inc.**, 369 Pine St., San Francisco, Calif., LB, **$295,873,** warehouse, other buildings, ENG 04-203-52-41, CASTLE AIR FORCE BASE, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids May 27. CD 5/15.

Los Angeles County Sanitation Dist. 19, 2020 Beverly Blvd., Los Angeles, Calif., rejected bids June 11

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West Artesia trunk sewers, LOS ANGELES, CALIF. LB, **$217,377.** CD 5/22.

Independent Constr. Co., 741 50 Ave., Oakland, Calif., LB **$233,637,** conduits appurtenance in 63 St. between Market and San Pablo Sts., grading, surf. Market St., etc. between Adeline and Berkeley city limits, OAKLAND, CALIF. City, City Hall, Oakland, Calif. Bids June 10. CD 5/28.

Waterbury & Chapek, 605 Fremont St., Sacramento, Calif., LB, **$149,333,** sewer and water lines, other work at Sacramento State College, SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif.

† **Cox Bros. Constr. Co.**, Box 36, Stanton, Calif. LB **$119,652,** rehabilitate pavement at Camp Mathews Marine Corp. Recruit Station, NOY 2672, Spec. 33862, SAN DIEGO, CALIF. Dpt. Navy, San Diego, Calif. Bids June 11.

A. W. Baum, 434 Bay St., San Francisco, Calif., LB **$185,904,** service bldg., Contract 139;
Payne Constr. Co., 876 Harrison St., San Francisco, Calif., LB, **$109,152,** approach lighting system trestles etc., Contract 134, all at San Francisco Airport, SAN FRANCISCO, CALIF. Public Utilities Comn., City Hall, San Francisco, Calif. CD 11/12/45.

Pipe Linings, Inc., P.O. Box 3428 Terminal Annex, Los Angeles, Calif., LB, **$304,070,** reline San Joaquin Pipeline 1, San Joaquin to Tesla Portal in San Joaquin River Hetch Hetchy Project HHWS 251, SAN FRANCISCO, CALIF. Pub. Utilities Comn., City Hall, San Francisco, Calif. Bids June 10. CD 6/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **J. C. Boespflug Constr. Co.**, 1912 4 Ave. S., Seattle, Wash. CA, **$1,447,376,** general contract;
Wenzler & Ward, 2109 Western Ave., Seattle, Wash., CA, **$664,967,** mechanical work for 7 story, 8x260 ft. structural steel, rein.-con. first unit of teaching HOSPITAL, SEATTLE, WASH. University of Washington, Seattle, 5, Wash. Bids June 10. CD 6/16, under LB.

John E. Branagh & Son, 105 Sheridan Ave., Piedmont, Calif., LB, **$575,700,** general contract 3 story, rein.-con. bldg., low temp. LABORATORY, BERKELEY, CALIF. University of California, Administration Bldg. Berkeley, Calif. Bids June 12. CD 5/21.

▲† **Peter Kiewit Sons' Co. & Fred J. Early Jr., Inc.**, 345 Kieways, Arcadia, Calif., LB. **$2,920,876,** expanding field training facilities, etc. Camp Horno, NOY 72624, Spec. 33814. CAMP PENDLETON, CALIF. Dpt. Navy, San Diego, Calif. Bids June 12. CD 5/14.

▲† **Allison-Honer Co. & Cox Bros. Constr. Co.**, P.O. Box 36, Santa Ana, Calif., LB, **$3,243,748** expansion of field training facilities at Camp San Mateo, NOY 72621, Spec. 33811, CAMP PENDLETON, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids June 16. CD 5/29.

▲† **George W. Carter Co.**, Box 17155 Foy Station, Los Angeles, Calif., LB, **$3,122,699,** expansion of field training facilities at Camp Pendleton Marine Station, Camp Margarita, NOY 72623, Spec. 33813, CAMP PENDLETON, CALIF. Dpt. Navy, San Diego, Calif. Bids May 21. CD 4/25.

▲ **Smith-Campbell Co.**, 6510 Cherry Ave., Long Beach, Calif., CA, **$885,574,** general contract John Marshall Junior High SCHOOL;
Joseph G. Klapper, 1129 S. Fair Oaks Ave., Pasadena, Calif., CA, **$836,900,** general contract Alexander Hamilton Junior High School, LONG BEACH, CALIF. City School District, 715 Locust St., Long Beach, Calif. Bids June 6, awarded June 9. CD 6/17, under LB.

▲ **Haas & Haynie**, 275 Pine St., San Francisco, Calif. LB, Item 1, **$4,558,000;** Item 2, **$4,509,000;** Item 3, **$4,226,000;** Item 4, **$3,748,000;** SCHOOL of Engineering, first increment U. S. Naval Post Graduate School, NOY 72361, Spec. 32778, MONTEREY, CALIF. Twelfth Naval Dist., San Bruno, Calif. Bids June 11. CD 5/13.

U. S. POSSESSIONS

BIDS ASKED—BUILDINGS

▲† **Virgin Islands, St. Croix**—SCHOOLS—B.A. 8/28—Office of Territories, Dpt. Interior, Interior Bldg., Wash., D. C., Sect. 1, Christiansted Consolidated School, and Lavalle Elementary School, alterations, masonry, rein.-con., frame, heating, plumbing and electrical, constr. $1,000,000. Plans deposit $50. M. A. Dyer Co., 24 School St., Boston, Mass., engr.-archt. CD 1/8.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Zequeira & Pinero, Inc.**, P.O. Box 239, Hato Rey, Puerto Rico, CA. **$184,000.** removing approx. 2,650 lin. ft. unsuitable flexible type wearing surf. and sub-base, replacing with 7 in. conc. runway pavement 50 ft. wide on sub-base of selected compacted material; construct 15 ft. shoulders of selected compacted materials along each side of new runway; placing of and extending existing culverts and electrical ducts and installing drainage, ditches at U. S. Naval Station Roosevelt Roads, PUERTO RICO. Dpt. Navy, P. Wks. Office, 10th Naval Dist., Headquarters, Navy No. 116, c/o Fleet P.O. New York, N. Y.

▲† **Montgomery Constr. Co.**, 803 W. Main St., Grove City, Pa., CA. **$1,943,226,** airmens dormitories and mess halls at Ramey Air Force Base, Inv. 52-121, AGUADILLA, PUERTO RICO. U. S. Eng., P.O. Box

4970, Jacksonville, Fla. Bids Apr. 11. CD 4/21, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Windsor—B.A. 7/3—Windsor Utilities Comn., 607 Canada Bldg., exten. filtration plant. $900,000. Plans deposit $50. Gore & Storrie, 130 Bay St., Toronto, engrs. CD 10/9/47.

HEAVY CONSTRUCTION

LOW BID AND CONTRACTS

▲ Dawson Wade & Co. Ltd., 775 Clark St., Vancouver, B. C., and British Columbia Bridge & Dredging Co. Ltd. 544 Howe St. Vancouver, B. C., CA, $4,500,000 two 200x5900 ft., 200x822 ft. runways taxistrips and aprons, Cold Lake Airport, COLD LAKE, ALTA. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Jan. 30, CD 10/30/51.

BRITISH COLUMBIA—Province of B. C., Douglas Bldg., Victoria,

Emil Anderson Constr. Co., Hope, B. C., CA, $530,912 reconstruct 5.42 mi. American Creek-Tale Section of Trans-Canada Hy. and erection of Emory Creek Bridge, Awarded June 10. N. M. McCallum, Douglas Bldg., Victoria, B. C., engr.

▲ Saint John Dry Dock Ltd., 7 Bayside Dr., St. John, N. B., CA, $2,390,184, wharf extension at Pugsley Terminal, ST. JOHN, N. B. Govt. of Canada National Harbors Bd., West Block, Ottawa, Ont. Bids June 11. CD 6/17, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Commonwealth Constr. Co., 300 Royal Bank Bldg., Winnipeg, Man., CA, 997,228, TELEPHONE Bldg., Ellice Ave., WINNIPEG, MAN. Manitoba Telephone System 166 Portage Ave. E. Winnipeg, Man. Bids May 21. CD 5/29, under LB.

▲ Danks Constr. Ltd., 619 Wentworth St. S., Hamilton, Ont., Owner Builds, $1,000,000, HOUSING, incl. 36 homes, on Douglas Rd., 35 homes on Lover's Lane, ANCASTER, ONT.

Govt. of Canada, Central Mortgage & Housing Corp., 441 Queen's Quay, Toronto, Ont., Day Labor, $950,000, 100 one story and half bsmnt., concrete, brick DWELLINGS, Pine and Henrietta Sts., SAULT STE. MARIE, ONT.

John T. Hodgson, 2991 Bloor St. W., Toronto, Ont., Owner Builds, $529,000, three 66 suites, 56x120 ft. each concrete, brick, steel frame APARTMENTS, Berry Rd., TORONTO, ONT. Hanks & Irwin, 2848 Bloor St. W., Toronto, Ont., archts.

E. G. M. Cape & Co., 620 Cathcart St., Montreal, Que., CA, $500,000 new bleaching MILL at pulp and paper mill CHANDLER, QUE. Gaspesia Sulphite Co. Ltd., Chandler, Que. H. K. Ferguson & Co., 19 Rector St. New York, N. Y., U. S. A., engrs. CD 5/29/45.

A. F. Byers Constr. Co. Ltd., 5674 Western Ave. Montreal, Que. CA, $525,000, 3 story, bsmnt., rein.-con., stone, Allan Memorial INSTITUTE WING to hospital on Pine Ave., MONTREAL, QUE. Royal Victoria Hospital Governors, 7 Pine Ave., Montreal, Que. Bids May 27. CD 5/15.

PROPOSED PROJECTS

WATER SUPPLY

Calif., Inglewood—City, 105 E. Queen St., 15 m.g. underground reservoir, $400,000 James M. Montgomery, 15 N. Raymond St., Pasadena, Calif., consult. engr.

Fla., Edgewater—City, water supply development and water distr. system, $250,000. Briley, Wilds & Assocs., P. O. Box 3052, Daytona Beach, consult. engrs.

Idaho, Orofino—City, City Hall, filtration plant $120,000. Bonds voted. Stevens & Koon, Spalding Bldg., Portland, Ore., consult. engrs.

Ind., Evansville—Bd. P. Wks., Mike Smith, supt. Water Works City Hall, water works (exten. distr. system), 6,480 6 in. mains Riverside and Weinback Aves., 4,750 ft. 6 in. mains in Buchanan Rd. 10,000 ft. 8 in. mains in Pollock and Vann Aves. $100,000. Edward C. Kerth, City Hall, city engr. CD 1/9/47.

▲ O., Defiance—Bd. Pub. Imprvs., City Hall, voted bonds; WW imprvs., intake valves, pumping equip., filtration plant, distr. sys., 300,000 gal. storage tanks. $1,120,000. Finkbeiner, Pettis & Strout, 518 Jefferson Ave., Toledo, consult. engrs.

Tex., Arlington—City, W. W. sys. rehabilitation, $85,000. new water mains, and distr. lines, $125,000. Joe J. Rady, 811 Insurance Bldg., Fort Worth, consult. engr. CD 5/26.

Tex., Denison—City, water supply line, $300,000. CD 8/3/50.

Tex., Ingleside—City, N. R. Erskine, mayor, voted bonds, water supply, pumping unit, storage, $85,000; water mains, distr. lines, $65,000. Myers & Noyes, Nixon Bldg., Corpus Christi, consult. engrs.

SEWERS, WASTE DISPOSAL

Fla., Avon Park—City, exten. sewerage sys., constr. sewage pumping stations, modification and expansion

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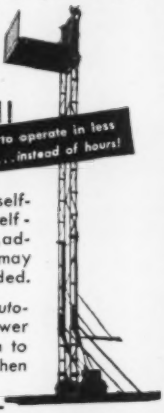

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of existing sewage treatment plant, $400,000. Briley, Wild & Assoc., P. O. Box 3052, Daytona Beach, consult. engrs.

Mich., Flint—Beecher Metropolitan Dist., R. C. Parks, secy., Flint, 153,530 ft. 8-to 18-in. sanitary sewers, 3,700 lin. ft. 10 in. c.i. force main, 25x25x20 ft. sewage pumping station. Ayres, Lewis, Norris & May 500 Wolverine Bldg., Ann Arbor, consult. engrs.

▲ Okla., Enid—City, City Hall, voted bonds, storm sewers, $851,000, Taft & Williams, Enid, consult. engrs; sewage disposal plant, sanitary sewers, $1,559,000, Hudgins, Thompson & Ball, 1100 W. Main St., Oklahoma City, consult. engrs. CD 4/9.

Okla., Oklahoma City—City, City Hall, sanitary sewers to serve N. Santa Fe Industrial Dist. $100,000. W. W. Baker, city engr.

Tex., Arlington—City, addnl. sanitary sewer line exten., $200,000; sanitary sewerage sys. rehabilitation, $85,000. Joe J. Rady, 811 Insurance Bldg., Fort Worth, consult. engr. CD 5/26.

Tex., Dallas—City, City Hall, Main and Harwood Sts., Pleasant Mound Sanitary Sewers, $275,000; Lake June Sanitary Sewers, $175,000; Pleasant Grove Sanitary Sewers, $250,000. Homer A. Hunter, 4704 Greenville St., consult. engr. CD 5/8.

Tex., Galveston—Gus Loomis & Harry Pransky, 1917 Rosenberg St., storm sewers, drainage, $60,000; sanitary sewers, $65,000.

Tex., Ingleside—Town, voted bonds, sewage disposal plant, $60,000; some sanitary sewer collection lines and storm, $80,000. Myers & Noyes, Nixon Bldg., Corpus Christi, consult. engrs. CD 5/26.

▲ Tex., Waco—City, City Hall, sanitary sewerage sys. rehabilitation, $1,000,000; new sewer lines, $2,900,000; lift stations, $350,000; sewage disposal units, $750,000. Joe J. Rady, 811 Insurance Bldg., Fort worth, consult. engr. CD 5/21.

Wash., Everett—School Dist. 2, Auditorium Bldg. 8 in. sewer from Madison School to connect with Everett Municipal system, $130,000. Sievers & Duecy, 2508 Colby St., consult. engrs.

BRIDGES

▲ O., Mt. Vernon—Comrs. Knox Co., Court House, replace 145 bridges throughout county. $1,644,480. Warren Veatch, c/o owner, engr.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Jefferson Co.—overflow bridges over Beaver Creek on U. S. 70, $250,000.

McClain Co.—bridge over Walnut Creek on Hy. 74 at Purcell $90,000.

Oklahoma Co.—bridge over Deep Fork on 77 near Witcher, $86,000. G. H. Bittle, c/o owner, engr.

▲ WASHINGTON—State Hy. Dpt., Olympia,
King Co.—extend Alaskan Way Viaduct southward, Seattle, $4,000,000.

Wash., Spokane—City, City Hall, bridge over Spokane River from Maple to Ash Sts., $5,192,000. C. E. Davis, city engr. CD 7/18/45.

STREETS AND ROADS

▲ ARIZONA—State Hy. Comn., Phoenix,
Route 60, $4,458,000
Route 66, $3,989,000
Route 69, $1,480,000
Route 70, $1,299,000
Route 73, $867,000
Route 77, $440,000;
Route 79, $816,000
Route 80, $2,866,000
Route 82, $435,000
Route 84, $1,801,000
Route 87, $447,000
Route 88, $115,000
Route 89, $2,922,000
Alternate Route 89 $77,000
Route 92, $165,000
Route 93, $463,000
Route 95, $100,000
Route 160, $100,000
Route 177, $200,000
Route 666, $189,000.

▲ Calif., Martinez—Contra Costa Co., Hall of Records, Martinez, voted $10,250,000 county road construction. CD 4/28.

▲ Ill., Chicago—City, City Hall, construct first link of South Route Expressway, $15,000,000. CD 2/13/45.

Ind., Indianapolis—Bd. P. Wks., City Hall, Zone 4, street wid'n. to 4 traffic lanes, asph. paving, incl. bridge over railroad and Pogue's Run Creek $240,000. W. R. Hunt, City Hall, city engr. CD 7/17/47.

Kan., Olathe—Comrs. Johnson Co., Court House wid'n. 3 lane 36 ft. repaving, special tr. to major intersections of 3½ mi. 75 St. $230,000, Ansel Mitchell, engr.

KENTUCKY—State Hy. Dpt., Frankfort,
Warren Co.—4 lane hy. 31-W north of Bowling Green, $689,400.

La., Lake Charles—Calcasieu Parish Police Jury, $100,000 bond election July 2, Ward 5 road imprvs.

Neb., Lincoln—City, City Hall, road paving at and in vicinity of municipal airport. $250,000. D. L. Erickson, city engr.

O., Cincinnati—City, City Hall exten. Erkenbrecker Ave., west from Vine St. to Jefferson Ave. and installing viaduct. $750,000. T. J. Montgomery, city engr.

O., Cleveland—City, City Hall, Zone 14, exten. Chester Ave. as divided highway from E. 93 St. to Cedar Ave. $750,000. John C. Wenrick, c/o owner, comr. Eng. CD 9/18/44.

O., Cleveland—Cuyahoga Co., Court House, concrete repaving (24 ft. wide) Tiedeman Rd. from Memphis Ave. to Brookpark Rd., Brooklyn. $350,000. Albert S. Porter, Standard Bldg., co. engr. CD 11/13.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,
Jefferson Co.—3 mi. new roadbed on Hy. 7 in Beaver Creek Valley. $125,000. G. H. Bittle, c/o owner, engr. CD 10/16/50.

Okla., Stillwater—City, City Hall, c. conc. paving 24 residential blocks in Dist. 109. $180,000. G. E. Bandelier, c/o owner, engr.

Wash., Seattle—City, County-City Bldg., Seattle, Zone 4, paving parking area under Alaskan Way Viaduct. $150,000. R. W. Finke, city engr.

▲† ALASKA—Alaska Road Comn., Dpt. Interior, Juneau, 131 mi. highway along Copper River from Cordova to Alaskan Hy. $15,000,000. CD 8-17/45.

EARTHWORK, WATERWAYS

▲ Mich., Detroit—City, Carl D. Warner, comr. Dpt. P. Wks., Guardian Bldg., concrete, steel dikes 2 mi. long, interlocking steel plate, Fox Creek area, $1,000,000. George R. Thompson, city engr. CD 4/12/51.

Okla., Enid—City, defeated bonds, flood control work. $295,000. CD 4/9.

† Tex., Brownswood—U. S. Eng., 100 W. Vickery St., Fort Worth, drainage and area site earthwork, grading, etc. $100,000. Frank T. Drought & Co., 117 W. Pecan St., San Antonio, consult engrs.

▲ Washington—Grant Co. Public Utility District, Ephrata hydro electric dam 550 ft. high on Columbia River Priest Rapids, Grant Co. $250,000,000.

AIRPORTS

Fla., Miami—GRADING, etc.—Dade Co., Court House, grading, paving and drainage Miami International Airport, $306,000. CD 4/26/50.

Neb., Lincoln—AIRPORT—City, City Hall, exten., resurf. runways at Municipal Airport. $150,000. D. L. Erickson, c/o owner, city engr. CD 12/17.

O., Cleveland—RUNWAY—City, City Hall, Zone 14, rebuilding runway at Cleveland Hopkins Municipal Airport. $240,000. John C. Wenrick, c/o owner, comr. Eng. CD 11/14/50.

† O., Dayton—AIRPORT—Ohio Air National Guard, Fort Hayes, Columbus, expand guard facilities at Dayton Municipal Airport, extend heavy duty dual and southwest runways from 5,000 and 5,500 ft. to 7,000 ft., erect headquarters bldg., concrete aprons, runways, warehouse, motor pool bldg. etc. $1,500,000.

▲ Tex., Dallas—AIRFIELD—City, City Hall, Main and Harwood Sts., addnl. development of Love Airfield. $13,000,000. J. G. Rollins, c/o owner, Ch. P. Wks. Engr. CD 5/9.

▲ Wash., Yakima—City, City Hall, airport expansion. $1,000,000. A. B. Collins, city engr.

PUBLIC BUILDINGS

† Ark., Shumaker—SHOP, etc.—Dpt. Navy, Eighth Naval Dist., U. S. Naval Station Bldg. 16, New Orleans, La. plans by Trapp & Clifford, Pyramid Bldg., Little Rock shop and storage bldg. $545,000. CD 12/12.

▲ Calif., Alhambra—SCHOOL, etc.—Alhambra School District, 601 N. Garfield St., voted $4,051,000 bonds, high school facilities; defeated $1,900,000 bonds elementary school; and $399,000 for stadium. CD 3/4.

Calif., Arcata—SCHOOL ADDNS., etc.—Arcata Union High School District, Arcata, voted $325,000 bonds, high school alterations, addns. Ernest Wheeler, 251 Post St., San Francisco, archt. CD 4/17.

Calif., Livermore—SCHOOL ADDNS, etc.—Livermore Joint Union High School Dist. of Alameda and Contra Counties, P.O. Box 272, Livermore, voted $320,000 bonds, school alterations, addns. John Carl Warnecke, 507 Howard St., San Francisco, archts. CD 4/18.

▲ Calif., Los Angeles—JUNIOR COLLEGE, etc.—Los Angeles City School District, 1425 S. San Pedro St., defeated $16,000,000 bonds, Junior College; and voted $130,000,000 bonds, for elementary and high school imprvs. CD 12/11/51.

Calif., Woodland—SCHOOL—Woodland City High School District, 2628 Pendegast St., voted $975,000 bonds, East Yolo Branch High School. CD 3/31.

▲ Conn., Greenwich—HOUSING—Town Housing Auth., Town Hall Annex, plans by Holden-McLaughlin Assocs., 57 Lexington Ave., New York, N. Y., housing, Cos Cob. $1,273,000.

▲ Idaho, Moscow—LIBRARY—University of Idaho, Moscow, library. $2,000,000.

▲ Ill., Chicago—OPERATIONS—Chicago Housing Auth., Merchandise Mart, Zone 54, steel, brick, concrete operations bldg., Elston Ave. and Armstrong St. $1,600,000. Battey & Childs, 231 S. LaSalle St., Zone 4, consult. engrs.

▲ Ind., Bloomington—DORMITORY—Indiana University Bd. Trustees, J. A. Franklin, exec. vice pres. Administration Bldg., plans by Edw. D. James, 122 E. Michigan St., Indianapolis, Zone 4, and Eggers & Higgins, assoc., archts., 100 E. 42 St., New York, N. Y., 7 story, bsmnt., X shaped, limestone facing, hollow tile, rein.-con. women's dormitory addn. $5,585,000. CD 4/7/48.

Ind., Fort Wayne—SCHOOL—School Bd., plans by A. M. Strauss, Strauss Bldg., Fort Wayne, grade school, W. State Blvd. and Tyler Ave., $300,000.

Ind., Mishawaka—SCHOOL—Penn Twp. School Bd., 117 Lincolnway plans by Roy Worden, 312 W. Colfax St., South Bend, grade school, $350,000.

Kan., Emporia—COURT HOUSE—Lyon Co., plans by Brinkman & Hagan, Emporia, court house. $450,000. CD 11/13/50.

Kan., Wellsville—SCHOOL—Joint School Dist. 1, Franklin, Douglas and Miami Counties, Wellsville, voted $325,000 bonds May 20, school.

Mass., Bourne—SCHOOL—Town, H. S. Clark, chn. Bldg. Comn., Sagamore Beach, and Supt. Schools, High School, Bourne, plans by Walter M. Gaffney, 43 Potter St., Hyannis, elementary school. $450,000.

Mass., Braintree—SCHOOL—Town, Supt. Schools, 10 Tremont St., plans by Howard L. Rich & Herman Tucker, 45 Newbury St., Boston, elementary school, Five site, Braintree Highlands. $346,000. CD 12/15/50.

▲ **Mass., Lowell**—HOUSING—Lowell Housing Auth., 562 Market St., plans by Krokyn & Browne, 184 Boylston St., Boston, 3, 6 and 9 story, bsmnt., brick, steel, concrete housing, South End Sect., $3,000,000. John J. Meagher, 78 Gorham St., Chelmsford, site planner, John C. & Walter T. Monahan, 219 Central St., Lowell, surv. CD 12/11/51.

Mich., Battle Creek—SCHOOL—St. Philip Catholic Parish, Battle Creek, brick, steel parochial school addn. $350,000.

Miss., Greenville — NURSE'S HOME — Washington Co., plans by N. W. Overstreet & Assoc., 201 N. Lamar St., Jackson, nurse's home for county hospital, $450,000.

Miss., Gulfport—SCHOOLS—City, plans by Smith & Dawson, Legion Bldg., Negro Junior High School. $350,000; East Side Junior High School, $350,000; West Side Junior High School, $350,000. CD 6/4.

▲ **Mo., Kansas City**—SCHOOL—Bd. Educ., c/o Dewey Smith, asst. supt., Library Bldg., 9 and Locust Sts., plans by Keene & Simpson, 15 W. 10 St., 207,000 sq. ft., 3,370,000 cu. ft. Intercity High School, library, auditorium, swimming pool, stadium, Truman and Winner Rds. $2,500,000. CD 12/4/51.

† **N. J., Trenton**—ARMORY, etc.—Dpt. Army, 121 N. Broad St., Phila., Pa., armory and motor vehicle storage bldg. $500,000. Tectonic Assocs., 115 W. Main St., Somerville, N. J., consult. engrs. CD 5/22 (Correction—name of and address of engineers).

▲ † **N. C., Fort Bragg**—HOSPITAL—U. S. Eng., 308 Customhouse, Wilmington, 500-bed hospital. $7,216,000.

▲ **N. C., Raleigh**—MEMORIAL MUSEUM—State, c/o Gov. Kerr Scott, State Capitol, memorial museum. $1,000,000.

† **O., Lorain**—ARMORY—Ohio National Guard, c/o Adjutant General Albert E. Henderson, Fort Hayes, Columbus, armory. $150,000.

† **O., Painesville**—ARMORY—Ohio National Guard, c/o Adjutant General Albert E. Henderson, Fort Hayes, Columbus, armory. $150,000.

† **O., Tiffin**—ARMORY—Ohio National Guard, c/o Adjutant General Albert E. Henderson, Fort Hayes, Columbus, armory. $150,000.

O., Urbana—COURT HOUSE—Comrs. Champaign Co., Court House, bond election Nov. 4, court house, $535,000. CD 11/11/48.

† **O., Willoughby**—ARMORY—Ohio National Guard, c/o Adjutant General Albert E. Henderson, Fort Hayes, Columbus, armory. $150,000.

▲ **Pa., Pittsburgh**—PARKING—Pittsburgh Parking Auth., City County Bldg., park and underground parking, Wm. Penn Place, 6 Ave. and Smithfield St. $4,000,000.

Pa., Uniontown—HIGH SCHOOL—School Dist. of North Union Twp., Uniontown, plans by Altman & Altman, Uniontown, 2 story, brick, concrete high school addn. $765,000. CD 3/9/49, under LB.

▲† **Tex., Brownwood**—CAMP REACTIVATION—U. S. Eng., 100 W. Vickery St., Fort Worth, misc. army bldgs. in military area, $2,750,000; barracks or housing, $3,000,000; storage or warehousing, $750,000. Frank T. Drought & Co., 117 W. Pecan St., San Antonio, consult. engrs. CD 12/5.

Tex., Christoval—SCHOOL, etc.—Christoval School Dist., Christoval, plans by John G. Beckerl, Holcombe-Blanton Bldg., San Angelo, some general school repairing, remodeling, addns., $300,000; gymnasium and educational unit, $300,000.

Tex., Dallas—SERVICE CENTER—City, City Hall, Main and Harwood Sts., plans by White & Prinz, 1330 N. Industrial Blvd., municipal service center in South Dallas near Holmes St. Bridge. $125,000. CD 5/8.

Tex., Fort Worth—SCHOOLS—Fort Worth Independent School Dist., 409 E. Weatherford St., M. G. Ellis School, $400,000; Forest Hill School, $375,000. CD 5/19/50.

Tex., Hillsboro — HOUSING — Hillsboro Housing Auth., Hillsboro, defeated bonds June 3, 75 low-rental housing, $550,000. CD 5/23.

Tex., Houston—SCHOOLS—Houston Independent School Dist., 1600 Washington St., plans by Stayton Nunn, 3272 Westheimer Rd., elementary school in Oak Meadows, $354,000; elementary school, Avenue B and Richmond Rd. in Bellaire, $300,000. CD 2/13.

Tex., Palestine—HIGH SCHOOL—Palestine Independent School Dist., Palestine, plans by O. L. Hazelwood, engrs.-archts., Ling Bldg., high school (Negroes), $325,000. CD 11/2.

▲† **Tex., Texarkana**—WAREHOUSES—U. S. Eng., Box 61, Tulsa 2, Okla., Unit 1, 100,000 sq. ft. 6 warehouse units, $750,000; Unit 2, 6 units of warehousing

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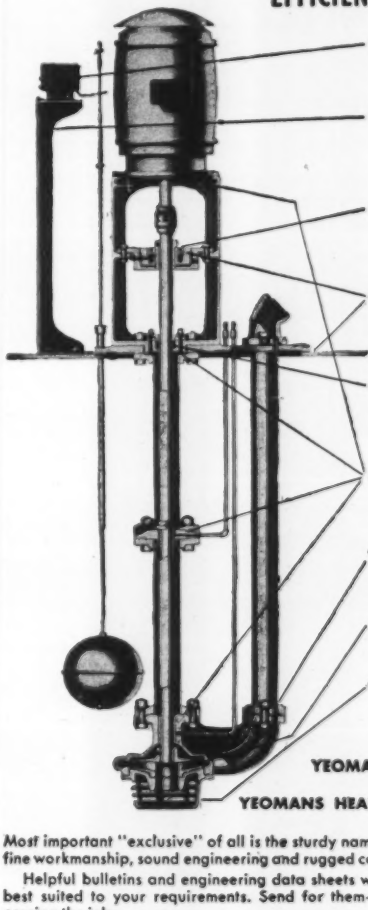

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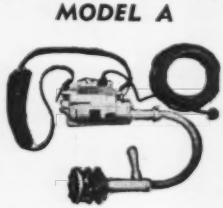

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▲ † Va., Fort Belvoir—HOSPITAL—U. S. Eng., 1 and Douglas Sts. N. W., Wash. 25, D. C., 250-bed hospital. $3,784,000.

▲ Wash., Seattle—SCHOOLS—School Dist. 1, 815 4 Ave. N., plans by John Graham & Co., Dexter Horton Bldg., Zone 4, elementary school in northeast part of city, $800,000; Lafayette Elementary School addn., $175,000; plans by G. W. Stoddard & Assoc., 1120 Harvard Ave., Arbor Heights Elementary School, $300,000; Fauntleroy Elementary School addn., $100,000; plans by Young Richardson, Carleton & Detlie, Central Bldg., Zone 4, Pacific pre-vocational school addn., $400,000; Brighton Elementary School addn., $150,000. CD 5/29.

Ont., Waterloo—COLLEGE—Waterloo College & Seminary, Waterloo, college bldg., $625,000. CD 6/13/46.

COMMERCIAL BUILDINGS

▲ Ariz., Phoenix—APARTMENT—Burke C. Payne, Albert Brygger, 124 W. Monroe St., plans by Ralph C. Harris, 53 W. Jackson St., Chicago, Ill., 13 story apartment $2,000,000.

▲ Conn., New Haven — PHYSICS LABORATORY — Yale University, New Haven, plans by Douglas Orr, 111 Whitney Ave., 6 story, concrete, stone physics laboratory, Sachem and Prospects Sts. $5,000,000. Meyer Strong & Jones, 101 Park Ave., New York, N. Y., mech. engrs. Henry A. Pfister, 111 Whitney Ave., New Haven, structural engr. CD 6/13/50.

Ill., Chicago—SHOPPING CENTER—Certified Realty Co., 609 W. 119 St., plans by Howard H. Peck, 5133 Oak Center, Oaklawn shopping center, Halsted St. and Vermont Rd. $400,000.

Ind., Indianapolis—OFFICE—American States Insurance Co., D. R. Gallahue, pres., Meridian and North Sts., Zone 4, plans by McGuire & Shook, 1400-01 Fletcher Trust Bldg., Zone 4, 1, 2 and 3 story, irregular, stone, rein.-con. office bldg. addn. $600,000.

▲ Ky., St. Matthews (Br. Louisville)—DEPARTMENT STORE—J. Bacon & Sons, 4 and Market Sts., Louisville, plans by Nevin & Morgan, Starks Bldg., Louisville, 3 story department store, $1,000,000, E. R. Ronald & Assoc., 554 S. Third St., Louisville, consult. engrs.

▲ Mo., Jennings (St. Louis 20, P.O.)—SHOPPING CENTER—Northland Shopping Center, Inc., G. J. Nooney, pres., Shell Bldg., 1221 Locust St., St. Louis, Zone 3, shopping center, incl. 9 buildings of various sizes totaling 1,000,000 sq. ft. floor space, parking facilities, W. Florissant Ave. and Locas and Hunt Rds. $10,000,000.

N. Y., Brooklyn—APARTMENT—Castle Homes, Inc., 9115 Ridge Blvd., Zone 9, plans by Maxfield Blaufeux, 44 Court St., Zone 2, 6 story apartment for 48 families, 9430-40 Ridge Blvd. $300,000.

O., Shaker Heights—CHURCH—First Unitarian Church, Shaker Heights, brick church, Belvoir Oval at Shaker Blvd. $500,000.

O., Youngstown—MOTEL—Leroy Kendis & Assoc., 2834 Courtland St., Cleveland, 2 story motel, 773 Wick Ave. $500,000.

Tenn., Maryville—CHAPEL—Maryville College, Maryville, plans by Barber & McMurry, 2505 Kingston Pike, S.W. Knoxville, rebuild Samuel Tyndale Chapel. $500,000.

▲ Tenn., Memphis—HOUSING—Cont. Mortgage Co., Osceola, Ark. Negro Housing, 1,500 homes, streets, etc. $12,000,000.

▲ Tex., Waco—SCHOOL of LAW and DORMITORY—Baylor University, Waco, plans by Easterwood & Easterwood, Bewley Bldg., Fort Worth, school of law, $400,000; womens dormitory, $1,000,000. CD 4/25.

Alaska, Anchorage—OFFICE—Chugach Electric Ass'n., Anchorage, office. $350,000.

▲ Ont., Hamilton—MEDICAL SCHOOL—McMaster University, Dr. G. P. Gilmour, pres., Westdale, Hamilton, Ont., medical school. $2,500,000. CD 11/22/50.

▲ Ont., Toronto—OFFICE—Stair Bldgs. Ltd., Bay and Adelaide Sts., plans by Marani & Morris, 1250 Bay St., 6 story, penthouse, stone, brick office. $2,000,000.

INDUSTRIAL BUILDINGS

▲ Ariz., Phoenix—PLANT—Reynolds Metals Co., Reynolds Metals Bldg., Richmond, 19, Va. 1 story, 500,000 sq. ft., brick, steel plant extension. $5,000,000. J. Gordon Turnbull, Inc., 2630 Chester Ave., Cleveland, 14, O., consult. engr. and archt.

▲ Calif., Redondo Beach—GENERATING PLANT—Southern California Edison Co., 601 W. 5 St., Los Angeles, steam generating plant $44,000,000. Stone & Webster, 601 W. 5 St., Los Angeles, consult. engrs. CD 5/24/46.

Ind., Hammond—WAREHOUSE, etc.—Graybar Electric Co., 5810 Calumet Ave., plans by Turner & Turner, 5246 Hohman Ave., 30,000 sq. ft. warehouse and office. $300,000.

Ia., Des Moines—FACTORY—United Biscuit Co. of America, 400 W. Madison St., Chicago, 6, Ill., factory, E. University Ave. $125,000. Westcott Eng. Co., 205 W. Wacker Dr., Chicago 6, Ill., consult. engr.

▲ Mass., Dighton—PLANT—Arnold Hoffman & Co., Inc., 55 Canal St., Providence, R. I., 3 story, 60x120 ft., brick structural steel chemical, dye plant addn. $1,000,000, Jenks & Ballou, 2600 Industrial Trust Bldg., Providence, R. I., consult. engrs. CD 3/13.

S. D., Sioux Falls—PLANT—Sioux Falls Argus Leader, 210 W. 9 St., plans by Hugill, Blatherwick & Fritzel, 367 Boyce Greeley Bldg., and Larson & McLaren, assoc. archts., 1901 Foshay Tower, Minneapolis, Minn., newspaper plant. $500,000.

Tenn., Nashville—PLANT—Sinclair Refining Co., 2315 Clifton Rd., oil and gas distr. plant. $350,000.

▲ Tex., Calallen—POWER STATION—Central Power & Light Co., 120 N. Chaparral St., Corpus Christi, Lon C. Hill Power Station on 140 acre tract 1½ mi. southeast of Calallen, 66,600 kw. $5,500,000. CD 10/8/51.

Tex., Dallas—WAREHOUSE—Titche-Goettinger Co., Elm and St. Paul Sts., Dallas, Tex. and Allied Stores, Charles McCarthy, pres., 401 5th Ave., New York, N. Y., plans by Thomas, Jameson & Merrill, 820 N. Harwood St., masonry warehouse and mezzanine addns. $225,000.

Tex., Houston—PLANT—Houston Chronicle, c/o Chronicle Bldg., plans by J. Russ Baty, Lamar Annex, 120x560 ft. newspaper print storage bldg., 10,000 tons print capacity, off Clinton Dr. $750,000. Robert J. Cummins, Bankers Mortgage Bldg., consult. engr.

Va., Smithfield—PLANT—P. D. Gwaltney & Co., Smithfield, packing plant. $400,000. Henschein-Everds & Crombie, 59 E. Van Buren St., Chicago, Ill., consult. engrs. CD 5/5/48, under LB.

Wash., Ellensburg—PLANT—Pictsweet Frozen Foods, Mount Vernon, food processing plant addn. $150,000.

Wash., Tacoma—WAREHOUSE—Washington Co-operative Farmers' Assn., 201 Eliot Ave. W., Seattle, feed warehouse addn. $200,000.

▲ Alta., Edmonton—STEEL MILL—Standard Ore & Alloys Corp., 120 Wall St., New York, N. Y., U.S.A., steel mill, $1,000,000.

▲ Que., Chicoutimi—ZINC REFINERY, etc.—American-Quebec Zinc Refinery Co. Ltd., 330 Bay St., Toronto, Ont., zinc refinery and smelter, Approx. $1,000,000. Singmaster & Breyer, 420 Lexington Ave., New York, N. Y. U.S.A., engrs.

▲ Que., Sherbrooke—PLANT—Superheater Co. Ltd., 200 Madison Ave., New York, N. Y., plant, $1,500,000, J. C. Day, 1434 St. Catherine St., Montreal, engr. CD 12/16/48.

UNCLASSIFIED

▲ Ill., Chicago—SHORE PROTECTION, etc.—Chicago Park Dist., 425 E. 14 St., Zone 5, voted bonds June 3, shore protection in parks along Lake Michigan Shore. $950,000; rehabilitation of Grant Park Bridges, $650,000; constr. new outer drive from 23 to 31 Sts., $4,000,000; repairing Washington Blvd., $1,400,000. CD 6/11/45.

▲ Ill., Chicago—SUBWAY—City, City Hall, extend West Side Subway from Chicago River to Halsted thence on surface in median strip of Congress St. Superhighway to 5400 West, $25,000,000. Bonds voted. Dpt. Subways & Super Highways, 20 N. Wacker Dr., Chicago, Zone 6, consult engr. CD 4/26/45.

Ind., Fort Wayne—PARKING LOT—Allen County Council, Court House, hard-surface parking lot for 3,000 cars at Allen County War Memorial Coliseum $125,000.

La., Leesville—SWIMMING POOL—City, $165,000 bond election July 1, swimming pool, etc. CD 5/2/51.

▲ Missouri—GAS DISTRIBUTION SERVICES—Missouri Public Service Co., Ralph J. Green, pres., Warrensburg, natural gas distr. services in Brookfield, Chillicothe, Brunswick, Hamilton, Shula, Trenton, Clinton, Glasgow, Salisbury, Keytesville, Marceline, Bucklin, Laclede, Meadville, Utica and Wheeling and connection with trunk pipeline of Panhandle Eastern Pipeline Co. $4,200,804.

New Mexico—GAS LINES—Southern Union Gas Co., Burt Bldg., Dallas, Tex., 21 mi. 20 in. gas line, radiating from Albuquerque, $390,000; 27 mi. 10 in. gas line from near Lovington to point in Eddy Co., $210,000.

O., Toledo—DRIVE-IN THEATER—Jesse James Enterprise, c/o Wm. P. Sanzenbacher, Erie Bldg., drive-in theater, double drive-in theater, South Ave., and Reynolds Rd. $250,000. Sanzenbacher, Morris & Taylor, Erie Bldg., consult. engrs.

S. D., Chamberlain—SWIMMING POOL, etc.—City, City Hall, plans by Harold Spitznagel & John Schoening, 816 Natl. Bank of South Dakota Bldg., Sioux Falls, swimming pool and bath house. $135,000.

▲ Texas—RURAL DISTRIBUTION LINES—Central Texas Electric Co-operative, Fredericksburg, complete sys. imprvs., 42 mi. transmission line, 52 mi. telines, Kimble, Mason and Kerr Counties. $1,350,000. CD 11/16/50.

† Tex., Brownwood—FUEL DISPENSING SYS., etc.—U. S. Eng., 100 W. Vickery St., Fort Worth, fuel dispensing sys., $150,000; electric area outside lighting sys., $75,000; gas system (domestic), $60,000; army railhead facility, $650,000, for Camp Bowie. Frank T. Drought & Co., 117 W. Pecan St., San Antonio, consult. engrs. CD 6/29.

▲ W. Va., Bluefield—YARDS—Norfolk & Western Ry., A. B. Stone, ch. engr., Roanoke, 1., Va. enlarging Bluefield Yards, incl. widening, extending tracks, relocating road, culverts, industrial siding and yard office and locker bldg. $2,100,000.

Que., Montreal—PARK IMPRVS.—Municipality, Imprv. general facilities at Jarry Park, $500,000; imprvs. at Saint Helen's Island Park, $700,000, H. A. Gibeau, City Hall, engr. CD 3/5/51 and 9/13/49.

(Proposal Advertisements see pp. 78 to 80)

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ Mass., Boston—PHYSICAL EDUCATION CENTER—B.A. 7/8—At office Coolidge, Shepley, Buehnch & Abbott, archts., 1 Court St., physical education center, for Northeastern University, 360 Huntington Ave., Boston, Mass. $1,000,000. CD 3/24.

SOON LETS CONTRACT—BUILDINGS

▲ Mass., Spencer — CHURCH — At office Harry L. Meacham Assoc., archts., N. Main St., Millbury, soon lets contract superstructure 67x180 ft. church and bell tower, for St. Joseph's Abbey, Rt. Rev. M. Edmond Futterer, O.C.S.O. Abbot, Alta Crest Rd., Spencer, Mass. Approx. $1,000,000. CD 3/27.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt P. Wks., 100 Nashua St., Boston,
Bethlehem Steel Co., 75 Federal St., Boston, Mass. LB $2,119,649, est. $1,500,000. Contr. C-2a, steel superstructure for elevated hy. port. on J. F. Fitzgerald Expressway, Boston. Bids June 10. CD 6/2.

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Gil Wyner Co., Inc., 12 Newland St., Maiden, Mass. LB $2,366,260, est. $2,100,000. U-331 (10) Contr. D. hys. Auto Rte. 128, Essex-Gloucester-Manchester;
Frank J. Shields Inc., P. O. Box 302, Southbridge, Mass. LB $343,583, est. $330,000. S-75 (7) hy. reconstr. Rte. 122 A, Rutland;
L. Romano Constr. Co., 2327 Pawtucket Ave., East Providence, R. I. LB $91,873, est. $90,000. S-75 (7) hys., Seekonk. Bids June 10. CD 6/2 and 6/4.
Wes-Julian Constr. Corp., 850 Providence, Hy., Dedham, Mass. CA $591,537. Contr. 152 Wellesley exten. relief sewer, Needham and Dover, BOSTON, MASS., State, Metropolitan Dist. Comn., 20 Somerset St., Boston, Mass. CD 6/10, under LB.

▲† Jefferson Constr. Co., 75 First St., Cambridge, Mass., LB $1,666,787, engine storage bldg. and Exten. Bldg. 17 Naval Air Station, Spec. 31271, QUONSET POINT, R. I. Pub. Wks. Office, 495 Summer St., Boston, Mass. Bids June 10. CD 5/14.

BUILDINGS

LOW BIDS AND CONTRACTS

M. Slotnick Corp., 333 Washington St., Boston, Mass. CA $908,620. P-M 51 NURSERY BLDG., Incl. 4 units, Myles Standish State School, TAUNTON, MASS. State, Dpt. Mental Health, 15 Ashburton Pl., Boston, Mass. Bids May 22. CD 5/16.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲† D. C., Wash.—HOSPITAL—B.A. 7/29—U. S. Eng., First and Douglas Sts. N.W., Wash., 25, D. C., hospital ward wing and auditorium, incl. site imprvs. and outside utilities at U. S. Soldier's Home, Serial No. CIVENG 49-080-52-42. Extended date. CD 5/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, N. Y., LB, $1,657,543, est. $1,660,000, 3.51 mi. Conduit Blvd., Pts. 3, 3A, S.H. 1699A, 1699C, 1953, F.A.R.C. 52-23, Nassau Co.; LB, $723,388, est. $848,000. 1.68 mi. Northern Sagtikos State Parkway N Sag SP 52-1; Suffolk Co.;
E. G. Lia & Sons Constr. Corp., New Hartford, N. Y., LB, $679,664, est. $718,000. 4.96 mi. Mayfield Village S.H. 5194-Mayfield Northville Parts 1 and 2, S.H. 368 and 541; Northville-Chapmans Corners SH 362, Northville Village-North S.H. 5065, FA.RC 52-26, Fulton Co.;
Federal Foundation Corp., 101 Park Ave., New York, N. Y., LB, $194,882, est. $200,000. 0.26 mi. Pine Island-New Jersey Line County Road 26, FA.SS, 52-9, Orange Co.;
Slattery Contg. Co., Inc., 46-36 54 Road, Maspeth, N. Y., LB, $1,398,842, est. $1,545,000, 2.78 mi. Greenvale-Glen Cove, Massapequa-Glen Cove, S.H. 9017, FA.RC 52-36, FA. SH 52-7 Nassau Co.;
D. A. Collins, Waterville Rd., Mechanicville, N. Y., LB, $219,123, est. $220,000, 4.44 mi. Tahawus-Schroon River Pt. 1 County Road FA.SS 50-1, Essex Co.;
S. J. Groves & Sons Co., Empire Bldg., Syracuse, N. Y., LB, $1,167,543, est. $1,300,000. 2.46 mi. New York State Thruway-Ontario Section Subdivision 1 and 2 (Ontario County Line to Tyre) and 8 Intersecting roads O.T. 52-9, ST 52-13 Seneca Co.;
A. E. Ottaviano, Inc., 80 Brook St., Croton-on-Hudson, N. Y., LB, $161,088, est. $180,000. 0.24 mi. New York State Thruway-New England Section Subs. 2 and 2A (Boston Post Road Detour) N.E.T.C. 52-1 Westchester Co.;
received no bids June 12, 1.55 mi. City of Watertown-Arsenal St., F.A.C.-52-4, FAG-C.52-5, Jefferson Co. CD 5/21. Bids June 12.

NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Albert P. Schmidt Constr. Co., Midland Park, N. J., LB, $236,237, est. $246,000, buildings, facilities, at Engine Terminal, elimination of grade wing of Erie R.R., D. L. & W. R.R. and N. Y. C. R.R. with various streets in city of Corning and Villages of South Corning, Riverside and Painted Post, PSC 9418, Steuben Co.;
received no bids June 12, Johnson City Bridge, Johnson City-Route 17, Conn. FASH 50-13, FA-SH 5209, Broome Co. Bids June 12. CD 5/21.
DeMarco & Cicconi, 151 E. Post Rd., White Plains, N. Y. LB, $506,974, Contr. 2, sewers south of W. Church St. and Pumping Station, ELMIRA, N. Y. Town, Town Hall, 1223 W. Water St., Elmira, N. Y. Bids May 28. CD 4/28.

▲ H. L. Gentry Constr. Co., Jackson, Mich., CA, $1,500,000. pipe line Linden, N. J., to Macungie, Pa.;
The Austin Co., 600 5 Ave., New York, N. Y., CA, $2,000,000. pumping station and tank farm, Linden, NEW JERSEY and PENNSYLVANIA. Buckeye Pipeline Co., 30 Broadway, New York, N. Y. Pipeline Engineering Co., 1901 S. 12 St., Allentown, Pa., engr.

NEW JERSEY—State Hy. Dpt., Trenton,
Lugano Bros., 172 Passaic Ave., Belleville, N. J. LB, $421,117, 0.317 mi. Rt. S-26. Sec. 1-C 0.128 mi. Rt. 25, Sect. 4-E, constr. Route S-26, Sec. 1C, bridge and approaches at Livingstone Ave. Connection North Brunswick Twp. AUT-95-22, Route 25 Sect. 4E Intersection Revision of Route S-28 City of New Brunswick, Middlesex Co. Bids June 10. CD 5/21.

▲† Gahagan Constr. Corp., 90 Broad St., New York, N. Y. CA, $1,117,350, dredging Schuylkill River between Phila., PENNSYLVANIA and Norristown, Montgomery Co., NEW JERSEY. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids May 28. CD 6/5, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Wild-Dale Homes, c/o Ira Kuchler, archt., 154 Nassau St., New York 7, N. Y. Owner Builds. $400,000. 36 HOUSES on 9-acre tract on Thomas Ave. and Fox Rd., BALDWIN, N. Y.

▲ Morton Brothers, 89-30, 161 St., Jamaica, N. Y. Owner Builds. $23,000,000 2,000 HOUSES on 500-acres tract on Plainview Rd. and Northern State Parkway to be called Morton Village, PLAINVIEW, N. Y.

Stewart Manor Gardens, c/o Max Simon, archt., 1841 Broadway, New York 23, N. Y. Owner Builds. $750,000. garden APARTMENT for 96-families, Covert and Tulip Aves., STEWART MANOR, N. Y.

Schaedel & Bro. Co., 1060 Broad St., Newark, N. J., CA, $455,959, Lincoln SCHOOL, SUMMIT, N. J. Bd. Educ., 87 Maple St., Summit, N. J. Bids May 27. CD 5/1.

Lawrence Constr. Co., Inc., 2503 St. Paul St., Baltimore, Md. LB, $457,173. brick, concrete, steel, concrete block Malden Choice Elementary SCHOOL addn., TOWSON, MD. Baltimore Co., Bd. Educ., Aigburth Rd., Towson, Md. Bids June 10. CD 6/25.

Harry A. Hudgins Co., 15 E. 21 St., Baltimore, Md. CA $500,000. 3 brick, steel concrete addns. to SCIENCE BLDG., TOWSON, MD. Goucher College for Girls, Dulaney Valley Rd., Towson, Md. Bids May 22. CD 5/7.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

M. J. Bles Constr. Co., McClean, Va., LB $461,350, Base Bid, $397,850, alt., for Relee storm and sanitary sewer proj., ARLINGTON, VA. Arlington Co., Sewer Div., Court House Rd., Arlington, Va. Bids June 11.

▲† T. A. Loving & Co., Greensboro, N. C., LB, $1,658,750. hangar bldg. at Peterfield Point. NOY 70703, CAMP LEJEUNE, N. C. Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, Charleston, S. C. Bids June 11. CD 5/1.

† Dickerson, Inc., Monroe, N. C., LB $569,525, road, parking areas and railroad spur at Charleston Airfield, No. 38-081-52-84, CHARLESTON, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids June 13.

▲† Cecil's Inc., Spartanburg, S. C., LB, $3,065,481, Schedule 1;
Byck Worrell Constr. Co., 318 E. Bay St., Savannah, Ga., LB, $2,921,692, Schedule 2, airmen's barracks, mess and administration bldg., warehouse, etc. at Hunter Air Force Base, Inv. 52-67, SAVANNAH, GA. U. S. Eng., Post Office Bldg., Savannah, Ga. Bids June 12. CD 3/21, under LB.

† Smith Eng. & Constr. Co., W. Pensacola St., Pensacola, Fla., LB, $724,184, repairs, imprvs. to storm drainage system at Whiting Field, MILTON, FLA. Officer-In-Charge of Construction, U. S. Naval Air Station, Pensacola, Fla.

† Edleblut Constr. Co., P.O. Box 2247, West Palm Beach, Fla. CA, $733,171, Phase 3, rehabilitation 64 buildings at Palm Beach International Airport, Inv. 57-146, WEST PALM BEACH, FLA. U. S. Eng., P.O. Box 4970 Jacksonville Fla. Bids May 29. CD 5/8.

▲† J. B. Michael & Co., Inc., 1021 Heywood St., Memphis, Tenn. LB $1,177,090. 7,000 ft. north-south runway, connecting taxiway, removing existing runway and 7 bldgs., Key Field, Eng. 01-076-52-71, MERIDIAN, MISS. U. S. Eng., P. O. Box 1169, 2301 Grand St., Mobile 7, Ala. Bids May 29. CD 4/25.

(Continued on page 95)

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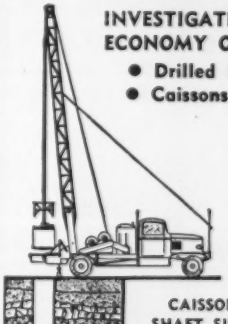

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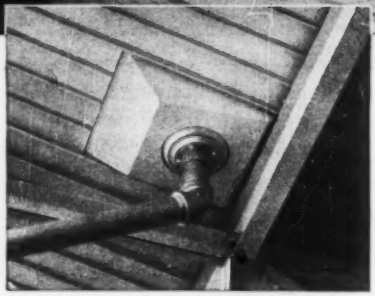
Mahon Steel Deck and Mahon Insulated Metal Wall Panels employed in New Building for L. A. Young Spring & Wire Company, Detroit, Mich. Christian W. Brant & Associates, Archts.; Barton-Malow Co., Gen. Contr.



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The view above shows a Mahon Steel Deck Roof together with Mahon "Flush Type" Insulated Metal Wall Panels employed in the construction of interior dividing walls. Mahon "Fluted Type" Insulated Metal Wall Panels were employed for exterior curtain walls in this same building. No matter how you compare the different types of roof construction and materials, you will find that Steel Deck is the most economical, permanent, firesafe roof material available today. It's light weight, and the fact that it can be insulated to produce the specific thermal properties required in any given locality, reduce total roof cost to an absolute minimum. Mahon Steel Deck is available in Galvanized or Enamel Coated Steel. In the enamel coating process, the metal is chemically cleaned and phosphated to provide paint bond, and the synthetic enamel is baked on at 350° F. prior to roll-forming. This is just one of the extra-value features of Mahon Steel Deck. See Sweet's Files for complete information, or write for Catalogs B-52-A and B.

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MAHON

(Continued from page 93)

BUILDINGS

LOW BIDS AND CONTRACTS

Schriber Contrg. Corp., 615 3rd St. N. E. Wash., D. C., CA. $560,000, 21-room Page SCHOOL, 14 and Lincoln Sts., ARLINGTON, Va. Bd. Educ., 1426 N. Quincy St., Arlington Va., Bids June 3 CD 6/9 under LB.

The English Constr. Co., Altavista, Va., CA. $678,700. HOSPITAL, SOUTH HILL, VA. Community Memorial Hospital, c/o Louis W. Ballou & Charles C. Justice, archts., 106 E. Cary St., Richmond, Va. Bids May 23. CD 6/2, under LB.

Shelby Constr. Co., 1106 Canal St., New Orleans, La. LB, $619,063, 100 unit HOUSING Project FLA 8-2, SARASOTA, FLA. Sarasota Housing Auth., Sarasota, Fla. Bids June 10. CD 5/5.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa., CA, $500,000, Ammonia Unloading FACILITIES, FAIRFIELD, ALA. Tennessee, Coal, Iron & R.R. Co., c/o Shaw & Renneke, archts., 2021 6 Ave. N., Birmimgham, Ala. Bids Mar. 13. CD 2/27.

Adams & Baker, Tuscaloosa, Ala., CA, $502,500, Vocational and Trades SCHOOL, TUSCALOOSA, ALA. Alabama State Bd. Educ., 503 Dexter Ave., Montgomery, Ala. Bids May 27. CD 6/4, under CA.

Berry & Totten, Eminence, Ky. LB $501,244. addns. to county SCHOOLS, LaGrange, Ballardsville, Liberty and Crestwood; new high SCHOOL, Buckner, LAGRANGE, KY. Oldham County Fiscal Court, LaGrange, Ky. Southern Eng. Co., 419 W. Main St., Louisville, Ky., engr. Wm. G. Crawford, 4030 Alton Rd., Louisville, Ky., archt. Bids June 12. CD 8/29/51, under Ky., Buckner.

L. A. Warlick Contg. Co., 747 E. 11 St., Chattanooga, Tenn. LB $510,500. chronic disease wing addn. to HOSPITAL, CHATTANOOGA, TENN. Baroness Erlanger Hospital, c/o Wm. A. Martin, archt., James Bldg., Chattanooga, Tenn. Bids June 10. CD 6/3.

South Memphis Realty & Constr. Co., Cotton Exchange Bldg., Memphis, Tenn. Owner Builds. $400,000. RESIDENCES, MEMPHIS, TENN.

Steadman Constr. Co., Kingsport, Tenn. LB $689,431. 4 new elementary SCHOOLS, 5 SCHOOL addns., MOUNTAIN CITY, TENN. Johnson Co. Bd. Educ., Mountain City, Tenn. Bids June 10. CD 5/9.

MIDDLE WEST

BIDS ASKED—BUILDINGS

Mich., Grand Rapids—SCHOOL—B.A. 7/9—Bd. Educ., 1432 Bostwick St. N. E., Mulick Park Elementary School, $495,000. Roger Allen & Assoc., 1126 Grant National Bank Bldg., archts. Stuart D. Long, 238 East Bldg., engr. CD 1/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **ILLINOIS**—Stats Div. Hys., Springfield, rejected bids June 6, intermittent bit. seal coat on various roads in Alexander, Franklin, Gallatin, Hardin, Jackson, Johnson, Massac, Pope, Pulaski, Randolph, Union and Williamson Counties, LB, $771,175; bit on grav. or crushed stone base 7.01 mi. F.A.S. Route 524, Coles and Douglas Counties, LB, $132,541; bit. base strengthening 19.1 mi. F.A. Route 160 and State Bond Issue Rt. 130, Cumberland, Effingham and Edwards Counties, LB, $142,549; bit. 3.68 mi. F.A.S. Route 669, Douglas Co., LB $139,831; intermittent bit. patching, resurf. U. S. Route 20 and Ill. Rt. 64, Kane, DeKalb, Will and Kendall Counties, LB, $188,861; intermittent bit. patching and resurf. Ill. Route 64 and 83, Kane and DuPage Counties, LB, $217,098; bit. 3.41 mi. F.A.S. Route 562, Logan Co., LB, $110,895; bit. 3.97 mi. U. S. Rt. 66, Sangamon Co., LB, $135,225; bit. 23.05 mi. Ill. Route 87, Tazewell, Woodford and Marshall Counties, LB, $79,809; grav. or crushed stone surf. course 3.11 mi. F.A.S. Route 19, Whiteside Co., LB, $158,823; grav. or crushed stone surf. course 3.46 mi. F.A.S. Route 271, La Salle Co., LB, $84,071. CD 6/11, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

Lewis & Frisinger, 214 E. Madison St., Ann Arbor, Mich. LB, $976,267. grading, drainage structures for dual roadway, service road 10.583 mi. US-12 relocation, FI 38-48 C7, M 38-48 C8, Jackson Co.;

Ann Arbor Constr. Co., 221 Felch St., Ann Arbor, Mich. LB, $581,969. b.-conc. surf. course 16.294 mi. US-112, M 46-4 C20, M 81-5 C14, Washtenaw Co.; LB, $412,199. c.-conc. surf. 7.306 mi. US-112, 22 ft. c.-conc. 3.636 mi. US-23 and M-17, M 81-5 C15, M 81-8 C4, Washtenaw Co.;

John & Paul Gillisse, Grandville, Mich. LB, $234,022. drainage structures 8.934 mi. US-31, F 70-41 C3, Ottawa Co.;

Taber-Carmody Co., 225 Front St. N.W., Grand Rapids, Mich. LB, $73,498. single double prime double seal 40.84 mi. M-91, M-57, M-46 and M-82, 9½ Ca, Ionia, Kent, Montcalm and Newaygo Counties; LB, $92,998, single seal prime, double seal 64 mi. M-88, M-137, M-37, M-113, M-63, US-10, US-31 and M-61, 11-Ca, Antrim, Lake, Grand Traverse, Osceola and Clare Counties;

Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich. LB, $282,226. 24 ft. c. conc. 2.481 mi. US-23 bypass, FI 73-50 C2, Saginaw Co.;

Walter H. Knapp, Monroe, Mich. LB, $814,498. 22 ft. c. conc. 8.285 mi. M-50, 78-B, Lenawee Co.; LB,

BLAW-KNOX GRATING

Electroforged into rigid, one-piece panels.

Twisted cross bar prevents slipping.

...GIVES BETTER SERVICE ON 5 COUNTS

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2 GREATER STRENGTH
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"We loaded trucks without booming or moving the crane..."

Yes—now you can do things with clamshells you never did before, and do them right from the cab—with the

"Tag Master"

TOPS IN BUCKET CONTROL

No man needed at the truck to guide the bucket that's TAG MASTER controlled. With this tag line pull (UNIFORM at all levels and adjustable to any job) you can turn, spin, snub or cast your clamshell direct from the cab. You get EXACT spotting, with a light drop that adds years to bucket life. In addition, the TAG MASTER can be used as a dipper trip. Send coupon now for more details of this combination tag line winder and dipper trip—and send it now.

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- No pins to cause delays—no time-consuming screw adjustments to become clogged.
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- Wooden upper member permits easy bracing.

Rooshors help you speed progress schedules because they are truly a time-saving shore. Only one man is needed to transport, set, release or remove them to new locations. They are instantly adjustable within their three ranges of sizes: 8 ft. to 14 ft., 7 ft. to 13 ft., and 5 ft. to 9 ft.—higher stories are easily shored with Roos Extension Shores.

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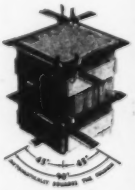
SAVE TIME, TOO!

Roos Column Clamps, consisting of two identical hinged units, eliminate lost time and motion in fitting and adjusting . . . there is no wrong way to put them on. They have no loose parts to cause needless delays and a hammer is the only tool needed.



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Stang WELLPOINT SYSTEM

For KNOW-HOW ENGINEERING SUPERVISION EQUIPMENT *to keep jobs* DRY

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JOHN W. STANG CORPORATION

2 Broadway, New York 4, N.Y. — 2123 S. 56th St., Omaha, Neb. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

$195,252. drainage 0.895 mi. M-20 relocation, F 56-26 C1, Midland Co. Bids June 11. CD 6/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **A. E. Anderson Constr. Corp.**, 1720 Military Rd., Buffalo, N. Y. CA. Approx. $1,400,000. rebuilding battery of 45 COKE OVENS, incl. new collecting main, Cuyahoga Heights, CLEVELAND, O. American Steel & Wire Div. of U. S. Steel, Rockefeller Bldg., Cleveland 13, O. Awarded June 11.

▲ **Haig M. Boyajohn & Assoc.**, 990 W. Third Ave., Columbus, Oo., CA. $1,899,213, 200x315 ft. brick, concrete, steel BUILDING to be used as a paint hangar for all finished aircraft, COLUMBUS, O. North American Aviation, Inc., International Airport, Los Angeles, Calif.

▲ **Herlihy-Midcontinent Co.**, 135 S. La Salle St., Chicago, 3, Ill., LB, $4,482,000, 7 APARTMENTS, incl. 55 units, 36 and Rhodes Sts., Ida B. Wells Extension, CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, 5, Ill. Bids June 11. CD 5/13.

▲ **George Arguillo**, 10926 Ashland Ave., Chicago, Ill., Owner Builds, $8,000,000, 400 HOMES, CHICAGO, ILL. H. E. Anderson, 7915 S. State St., Chicago, Ill., archt. Awarded June 12.

▲ **H. M. Robbins & Assoc.**, 5847 W. Touhy Ave., Chicago, Ill. Owner Builds, $1,100,000, 100 HOMES along Harlem Ave. and Oconto St., NILES, ILL. A. J. Del Bianco, 5501 W. Irving Park Rd., Chicago, 41, Ill., archt. Awarded June 4.

Hoffman Co., Inc., 1519 N. Oneida St., Appleton, Wis., CA, $547,400, general contract 2 story, ground floor U-shaped, grade SCHOOL with two 2 story, 238x224x 246 ft. overall wings, APPLETON, WIS. Bd. Educ., Appleton, Wis. Bids May 9, awarded May 29. CD 5/31, under LB.

▲† **Feyles Constr. Co.**, 711 Wesley Temple Bldg., Minneapolis, Minn., CA, Approx. $16,000,000, rehabilitate POWDER PLANT at Badger Ordnance Works, BARABOO, WIS., U. S. Eng., Office The Resident Engineer, Baraboo, Wis. Awarded June 5.

▲ **Garling's**, 15620 Michigan Ave., Dearborn, Mich. Owner Builds. $1,250,000. 120 brick ranch HOUSES, Dearborn Inn Section, Carlysle and Raymond Aves., DEARBORN, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Sebco, Inc.**, 100 Currie Ave., Minneapolis, Minn. CA $689,407, three 2 story frame dormitories, 1 story frame mess-admin. bldg., Wold-Chamberlain Air Force Base, MINNEAPOLIS, MINN. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. CD 6/5, under LB.

▲† **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., LB, $2,249,315;

Henry Hackett, Inc., Box 1388, Rapid City, S. D., LB Alternate $2,246,888, barracks, mess halls and utilities Rapid City Air Force Base, Inv. 52-94, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids June 11.

† **Secor Building Co., Inc.**, 201 Plaza Court Bldg., Oklahoma City, Okla. CA $686,549. training bldg., steam distr. sys., Smoky Hill Air Force Base, Eng. 23-028-52-36, SALINA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids May 10, awarded May 16. CD 5/27, under LB.

† **Builders Constr. Co.**, Braniff Bldg., Oklahoma City 2, Okla., LB $607,597, est. $500,000, rebuilding 10 bldgs. for married mens quarters;

Burton-Miller Co., Ardmore, Okla., LB $174,000, est $175,000. rebuild 6 warehouses and barracks; LB $144,000, rebuild M.E.Q. bldgs., 41 through 46 at Naval Air Training Center, NORMAN, OKLA. Dpt. Navy, 8th Naval Dist., Bldg. 16, Naval Station, New Orleans, La. bids May 28.

▲ TEXAS—State Hy. Dpt., State Highway Bldg., Austin,

F. M. Reeves & Sons of Austin, Inc., P. O. Box 972, Austin, Tex., CA. $1,508,304, grading, drainage, structures and pavement 0.599 mi. U. S. 81, Proj. UI 1083 (13), Bexar Co.;

Ernest Loyd, P. O. Box 1120, Fort Worth, Tex., CA. $517,838, flexible base, curb and gutter, and railroad underpass 2.691 mi. Hy. U. S. 62 and Loop 230, Proj. F 433 (18), Lubbock Co. Bids May 20, awarded May 27. CD 5/26, under LB.

▲† U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. rejected bids May 9, dredging channel from Port Aransas-Corpus Christi Waterway, to Reynolds Metals Co. Aluminum Plant, near LaQuinta, Inv. No. CIVENG 41-243-52-80, TEXAS. LB, $1,576,803. CD 5/19, under LB.

▲ **Farnsworth & Chambers Co., Inc.**, Box 74, Houston, Tex. CA $1,128,950. Wharf No. 8, HOUSTON, TEX. Harris County Ship Channel Navigation Dist. Wharf 13, North Side Turning Basin, Houston, Tex. Bids June 6. CD 5/21.

Latimer Constr. Co., 930 Wyandot, Denver, Colo., CA $575,619, est. $700,000. storm sewer in District 372, DENVER, COLO. City and Denver Co., City and County Bldg., Denver, Colo. Bids June 3, awarded June 9. CD 6/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

State Bd. P. Bldgs., c/o Gov. Forrest Smith, chn., Capitol, Jefferson City, Mo. rejected bids May 26,

(Continued on page 98)

P&H MAGNETORQUE* is the electric swing that never wears out

Just what does Magnetorque mean to you in this great 2½ yd. shovel? Simply this: It eliminates the old swing frictions with their constant headaches and replacement costs. It gives you the smoothest, slickest swing you ever saw—15% to 25% faster than any other machine of its size—and Magnetorque will last the life of your machine.

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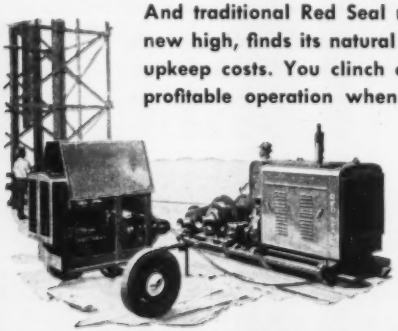
VITAL AS IT IS, horsepower rating is only one of several points about the engine which you should check carefully when investing in construction machinery. Fully as important in their bearing on the unit's long-range earning power are such factors as fuel economy and long life. And with one of today's Continental Red Seal engines powering your shovels, mixers, compressors, pumps and other equipment, you get a balanced combination of all three . . . In design, in materials, and in lasting performance, Red Seal engines give you the benefit of 50 years' aggressive engineering. Exclusive Continental features wring the power from the fuel—gasoline, Diesel, L.P.G. And traditional Red Seal ruggedness, carried to a new high, finds its natural reflection in rock-bottom upkeep costs. You clinch all three main factors in profitable operation when you choose equipment with Continental Red Seal power.



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PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation
MUSKEGON, MICHIGAN

(Continued from page 96)

2 story, bsmnt., 91x201 ft., brick, rein.-con. office for Division of Employment Security, JEFFERSON CITY, MO. LB $495,000. Will re-advertise CD 6/3, under LB.

▲ **Lummus Co.**, 385 Madison Ave., New York, N. Y., CA Est. $5,000,000, REFINERY ADDNS., EL DORADO, ARK.: Lion Oil Co., El Dorado, Ark. CD 2/20.

▲ **Reynolds Metals Co.**, 3 and Grace Sts., Richmond, Va. Separate Contracts; steel: American Bridge Co., Roanoke, Va., 20-odd FACTORY bldgs. GUM SPRINGS, ARK. Est. $30,000,000 CD 3/18.

▲ **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb. CA $4,146,205, general contract; **B. Grunwald**, 1110 Farnam St., Omaha, Neb. CA $723,-112. mechanical contract;

Evans Electric Constr. Co., 1617 Cuming St., Omaha, Neb. CA $519,592. electrical contract for AUDITORIUM, OMAHA, NEB. City, City Hall, 18 and Farnam Sts., Omaha, Neb. Grand total $5,389,009. CD 5/16, under LB.

▲ **Patti Constr. Co.**, 1340 Admiral Blvd., Kansas City, Mo. CA approx. total $6,000,000. superstructure mfg. PLANT, west of Kansas City, near TURNER, KAN. Fairbanks-Morse Co., 600 S. Michigan St., Chicago, Ill. Bids May 13. CD 5/6.

San Jacinto Chemical Corp., c/o San Jacinto Ordnance Depot, Houston, Tex., Own Forces. $450,000. PLANT expansion to recover nitrogen, HOUSTON, TEX. CD 4/17.

Platt-Rogers, Inc., 1503 W. 13 St., Denver, Colo., LB, $518,679, general contract 4 story, 32x150 ft. north wing, 3 story, 32x150 ft. south wing, brick terra cotta men's DORMITORY, COLORADO SPRINGS, COLO. Colorado College, Colorado Springs, Colo. Bids June 5. CD 6/3.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Calif., Miramar**—MEN'S CLUB—B.A. 7/11—Dpt. Navy, San Diego, enlisted men's club, supply facilities, pump house, service station at Naval Air Station, NOY 71090, Spec. 32644. $500,000. Plans deposit $80. CD 1/8/51.

† **Calif., El Toro**—PUBLIC WORKS BLDG.—B.A. 7/22—Dpt. Navy, San Diego, 2 story public works bldg., metal trades bldg., shop store bldg., at El Toro Marine Corps Air Station, NOY 71129, Spec. 32683. $750,000. Plans deposit $90.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **McNutt Bros.**, Eugene, Ore., LB, $951,608, est. $900,697 relocation 8.1 mi. roads in Lucky Peak Dam area, Inv. 52-106, Adam and Boise Counties, IDAHO. U. S. Eng., City and County Airport, Walla Walla, Wash. Bids June 10. CD 6/3.

WASHINGTON—State Hy. Dpt., Olympia,

Standard Asphalt Paving Co., Chronicle Bldg., Spokane, Wash., CA, $61,937, non-skid single seal tr. and bit. penetration macad. 17.7 mi. Hy. 3 Clarkston to Oregon state line, Federal Aid, Asotin Co.;

Goetz & Brennan, Seaboard Bldg., Seattle 1, Wash., CA, $149,734, est. $154,000, light bit. 19 mi. Hy. 1, Brewster east Federal Aid, Okanongan Co.;

F. R. Hewett, Parkwater, Wash., CA, $490,612, est. $557,555, bit. surf., rein.-con. slab bridge 9.4 mi. Hy. 4-C, Hesseltine to Wilbur, Federal Air, Lincoln Co. Grand total $702,283. Bids June 10.

▲† **Cherf Bros. Constr. Co. & Sandkay Contractors, Inc.**, Ephrata, Wash., CA, $1,031,574, est. $1,052,219 earthwork, asph. membrane lining and structures for Area W-6A laterals, sublaterals and wasteways, West Canal laterals and Columbia Basin Proj., Spec. DC-3710 WASHINGTON. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Bids May 27, awarded June 6. CD 6/5, under LB.

▲ **Manson Constr. & Eng. Co.**, 821 Alaskan Way, Seattle, Wash., LB, $1,075,000, reroulding Piers 1, 2, and 3, TACOMA, WASH. P. Wks. Officer, Thirteenth Naval Dist. ,1611 W. Wheeler St., Seattle, Wash. Bids June 12. CD 5/26.

† **Urban Plumbing & Heating Co.**, 2904 S.W. 1st. St., Portland, Ore., CA. $548,051. furnish, install equip., Detroit Dam Power House, CIVENG 35-026-52-136, Marion Co., OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids May 20, awarded June 3. CD 4/30.

† **Cramer & Dunlap**, 1900 W. 21 St., Tulsa, Okla., CA, $583,462, tower steel for use on Maupin-Detroit No. 2 line, Inv. 6503, Deschutes and Marion Counties, OREGON. Bonneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Awarded June 5.

† **Wm. A. Smith Constr. Co.**, 108 W. 6 St., Los Angeles, Calif., LB, $484,500, repair and replace railroad trackage, NOY 72951, Spec. 34986, INYOKERN, CALIF. Naval Ordnance Test Station, Inyokern, Calif. Bids June 9.

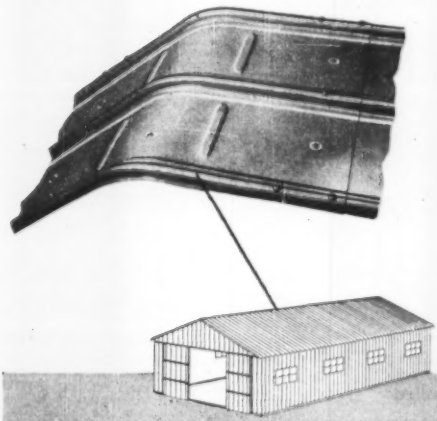
A. **Teichert & Son**, Box 436, North Hollywood, Calif., LB, $694,615, May Canyon Debris Basin and channel, Sunland, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 751 S. Figueroa St., Los Angeles, Calif. Bids June 10. CD 5/22.

▲ **Bent Constr. Co. & Daley Corp.**, Box 67, North Park Station, San Diego, Calif., LB, $2,896,485, completing Sutherland Dam multiple arch, rein.-con. structure on Santa Ysabel Creek, SAN DIEGO, CALIF. City Council, Civic Center, San Diego, Calif. Bids June 10. CD 4/23.

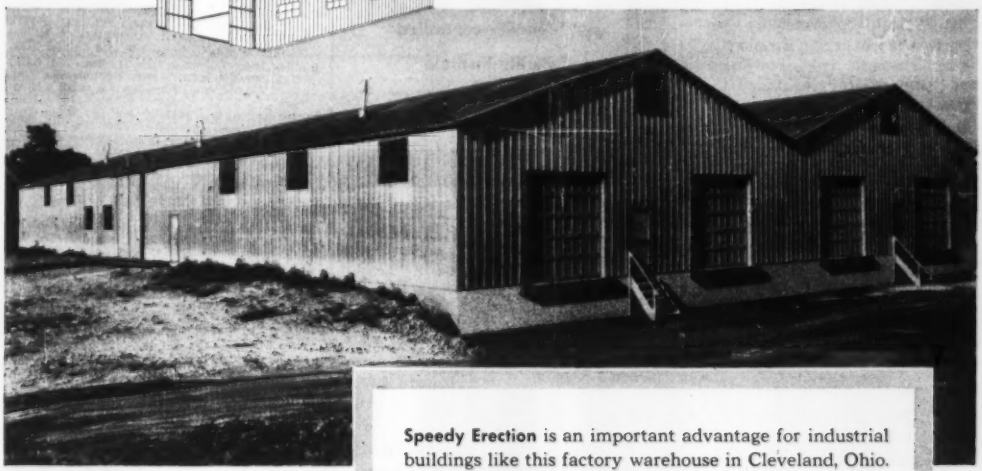
▲† **M. H. Golden Constr. Co.**, 3485 Noel St., San Diego, Calif., LB, $1,008,734, constr. instruction facilities at Fleet Air Defence Training Center, NOY 71060, Spec. 32614, SAN DIEGO, CALIF. Dpt. Navy, San Diego, Calif. Bids June 6. CD 5/14.

(Continued on page 100)

One-Piece Ridge Sheets *Assure* Greater Weathertightness



ONE-PIECE ROOF RIDGE . . . is a feature of Butler Buildings that pays off in faster, easier construction . . . greater weathertightness. The one-piece, die-formed roof ridge eliminates ridge roll, flashings, sealer strips, and rust-vulnerable lap joints, and forms a leakproof, weathertight roof that is easier and quicker to erect. And there are *many other* special Butler features that make Butler Buildings adaptable to practically any kind of new building construction or expansion.



Speedy Erection is an important advantage for industrial buildings like this factory warehouse in Cleveland, Ohio. This multiple-unit installation of two 50′ Butler Buildings has the die-formed one-piece roof ridge and other Butler features that help assure speedy erection for early occupancy.

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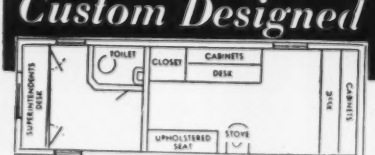

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WASHINGTON 16, D. C.

Founded in 1936—House Trailer Headquarters in Our Nation's Capital for 16 Years.

(Continued from page 98)

BUILDINGS

LOW BIDS AND CONTRACTS

Malarkey & Moore, 9238 S.W. 17 St., Portland, Ore., LB $965,784, 4 story, rein.-con. HOSPITAL addn., LONGVIEW, WASH. St. John's Hospital, Longview, Wash. Bids June 12. CD 5/22.

Roy L. Bair & Co., 1220 Ide St., Spokane, Wash., CA, $756,889, HOUSING for employees at Lakeland Village, MEDICAL LAKE, WASH. State Dpt. Institutions, Olympia, Wash. Bids June 4. CD 6/10, under LB.

▲ J. C. Boespflug Constr. Co., 1912 4 Ave. S. Seattle, Wash., LB, $1,447,376, general contract;

W. E. Beggs, 234 9 Ave., N., Seattle, Wash., LB, $627,817, mechanical work, 7 story, 80x270 ft., structural steel, rein.-con. first unit teaching HOSPITAL, SEATTLE, WASH. University of Washington, Seattle, Zone 5, Wash. Bids June 10. CD 5/13.

▲† Viesko & Post, Box 69, Salem, Ore, CA $1,672,156. COURT HOUSE, SALEM, ORE. Marion Co., Court House, Salem, Ore., Bids May 15, awarded June 5. CD 5/20, under LB.

† Elliott Co., Jeanette, Pa., CA, $464,850 furnishing, installing two 7,500 kva vertical-shaft GENERATORS for Nimbus Power Plant, Central Valley Proj., Spec. DC 3696, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Bids May 8, awarded June 6. CD 5/16, under LB.

▲ M. J. Brock & Sons, Inc., 3894 Rowena Ave., Los Angeles, Calif., R. J. Daum Constr. Co., 6803 West Bldg., Inglewood, Calif., LB, $2,565,304, new JUNIOR COLLEGE, Artesia St. and Santa Fe Ave., COMPTON, CALIF. Compton Junior College Dist., 620 S. Acacia St., Compton, Calif. Bids June 11.

Lemon Grove School Dist., 7580 Golden Ave., Lemon Grove, Calif, rejected bids Apr. 8, new classroom and remodeling existing SCHOOL, LEMON GROVE, CALIF. LB $499,481. CD 4/15, under LB.

Westwood Builders, 509 S. Beverly Dr., Beverly Hills, Calif., LB, $606,000, 2 story, rein.-con. COURTS BLDGS., PASADENA, CALIF. Los Angeles Co. Hall of Records, Los Angeles, Calif. Bids June 10. CD 5/22.

▲ Allison Honer Co., 312 N. Main St., Santa Ana, Calif., LB, $1,045,263; social sciences and humanities bldg. LB, $3,736,657, low combination bids on all 4 buildings;

Brunzeil Constr. Co., 3945 Higuera St., Culver City, Calif., $1,091,409, physical education bldg.;

H. M. Hodges, 5531 Venice Blvd., Los Angeles, Calif., LB, $855,900, physical sciences bldg.;

J. Putnam Henck, Skyforest, Calif., LB, $723,433, library and classroom bldg. at Riverside Campus, RIVERSIDE, CALIF. University of California, 405 Hilgard Ave., Los Angeles, Calif. Bids June 10. CD 5/22.

Paul W. Trousdale, 1188 Highland Ave., San Bernardino, Calif., CA, $440,000, 40 frame, stucco DWELLINGS in Tract 3614, SAN BERNARDINO, CALIF.. Marshall-Highland Homes, Inc., 1188 Highland Ave., San Bernardino, Calif.

▲ F. E. Young Constr. Co., 2141 Main St., San Diego, Calif., CA, $1,693,500, 3 story, rein.-con. PUBLIC LIBRARY bldg., SAN DIEGO, CALIF. City, Civic Center, San Diego, Calif. Bids June 10. CD 5/29, under LB.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † Anderson-Montin-Benson, Central Bldg., Seattle 4, Wash., CA. $1,977,000, est. $2,600,000. 1 story, 162x358 ft., rein.-con. and masonry field house, Inv. 52-23 Eielson Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Mar. 12. CD 3/18, under LB.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ St. John Dry Dock Co., Ltd., Bayside Dr., East St. John, N. B., $2,390,183, WHARF EXTEN. at Pugsley Terminal wharf facilities for 3 ocean-going ships ST. JOHNS, N. B., National Harbours Bd., West Block, Parliament Bldgs., Ottawa, Ont. Bids June 11. CD 5/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Pigott Constr. Co. Ltd., 36 James St. S., Hamilton, Ont., CA, Total cost $60,000,000, excavation and concrete work on COLD MILL PROJECT in connection with new open hearth steel mill addn., HAMILTON, ONT. Steel Co. of Canada Ltd., Wilcox St., Hamilton, Ont. W. L. Charter, c/o owner, ch. engr. Awarded June 10. CD 1/11/51.

J. L. E. Price Co. Ltd., 4 Collier St., Toronto, Ont., CA, $800,000, 2 story, bsmnt. L-shaped, 65x104 ft. brick SCHOOL of Nursing, TORONTO, ONT. University of Toronto, Simcoe Hall, Toronto, Ont. Bids May 28, awarded June 10. CD 5/5.

Quemont Constr. Inc., 285 Bernard Ave., Montreal, Que., CA, $750,000, 4 story, 101x195 ft., rein.-con. veterinary school, ST. HYACINTHE, QUE. Province of Quebec, Dpt. Agriculture, Quebec City, Que. CD 8/1/61.

HOW J & L JUNIOR BEAMS SAVE TIME, SOLVE DESIGN PROBLEM AT LOW COST IN

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Architect P. Arthur D'Orazio and George J. Murphy Company, contractors-engineers, of Youngstown, Ohio, have employed lightweight J&L Junior Beams as cantilevered roof purlins at the Boardman Center's ultra-modern St. Charles School near Youngstown. J. A. McMahon, Ltd., Niles, Ohio, fabricated the 85 tons of structural steel and 35 tons of Junior Beam joists going into the framework.

Notched over lintel beams and cantilevered four feet beyond the outside walls, J&L Junior Beams support not only the roof but also an attractive permanent sun shield over classroom window walls.

Because of their versatility and adaptability, J&L Junior Beams go far towards meeting the demands of today's builders. They cost less to buy and less to erect. Lightweight, 12" Junior Beams, 11.8 lbs. per foot, 30 ft. long, may be easily raised, placed and bolted directly into position by three men with the aid of only a hand-operated winch.

The lightweight and consequent ease with which Junior Beams can be handled led to fast, economical construction that helped hold building costs to a minimum. ALL STRUCTURAL STEEL INCLUDING THE JUNIOR BEAM ROOF PURLINS WAS ERECTED BY 6 MEN IN 2 DAYS.

ARCHITECTS — CONTRACTORS

If you're engaged in the design, or construction of light occupancy buildings, you'll be interested in these features offered by J&L Junior Beams. EASY TO INSTALL, RIGID, VIBRATION RESISTANT, SHRINK PROOF, LOWEST DEFLECTION FACTOR OF ANY STRUCTURAL SECTION OF EQUIVALENT WEIGHT.

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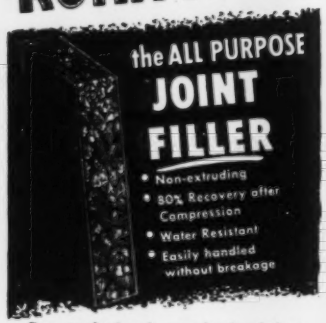

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Blasting mat made from old tires

When it comes to the subject of blasting mats, this is the situation: A light mat that's easy to handle will go up in the air with the blasted material; a heavy mat that keeps the blast down is hard to move and handle. This "Bombproof" mat changes all that. It's constructed of old automobile tires whose cord construction, flexibility and abrasion resistance makes it long-wearing. Weighing only 20 lb per sq ft, they're constructed in 3-, 4½- and 6-ft widths and in lengths up to 10 ft. or more. Harter and Thayer Co., contractors from Princeton, Minnesota found that "they have numerous advantages over other types, are durable, flexible and easily repaired." On a Duluth, Minnesota building site they "covered every charge during the blasting of some 2,000 yds of solid rock without repair to the rubber mats." O. B. Wasbotten & Sons, 1609 Arrowhead Road, Duluth 2, Minnesota.

Johnson develops repeater for automatic re-batching

To increase the efficiency of transit mix and central mix concrete operations, a pushbutton control panel has been developed by the C. S. Johnson Co. that can automatically produce 24 different size and type batches of aggregate and cement. In addition, a repeater mechanism provides uninterrupted rebatching of any one selection a predetermined number of times. The mix selection mechanism is electrically controlled, and installed under the multiple-compartment cement and aggregate bin. A central dial scale unit controls automatic material batchers on each compartment and its pen records the weights. A water batcher and cement batcher provide for automatic moisture compensation. A dial on the 24-mix selector provides for 2500-lb or 3,000-lb concrete in batches of ½, ¾ or 1 yard. On each batch there's selection for 3-, 4-, 5- or 6-in. slumps, making it a simple matter to change from one batch to another. The repeater mechanism provides rebatching of the initial batch 1, 2 or 3 times to make up a full mixer charge. The operator merely sets the mix selector, then sets the repeater and pushes the start button; it's as simple as that. Contact the Koehring Company, Milwaukee 16, Wisconsin, or its subsidiary, C. S. Johnson Co., Champaign, Illinois.

New toggle bolt assembly is three-in-one type

A new type toggle bolt is now available which is said to offer three distinct advantages not previously obtainable. Super-grip three-in-one toggle bolts may be installed with either (1) the head of the bolt outside a wall, (2) the nut outside or (3) with toggles purchased separately and used with any bolt. This makes possible reduced inventories because the toggle bolt is reversible in the head and provides flexibility not heretofore possible. The toggle head is available from stock for bolt diameters from ⅛ to ½-in. Super-Grip Anchor Bolt Company, Inc., 3333 N. 22nd Street, Philadelphia 40, Pennsylvania.

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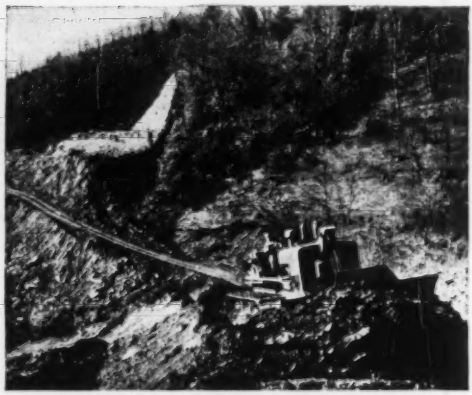
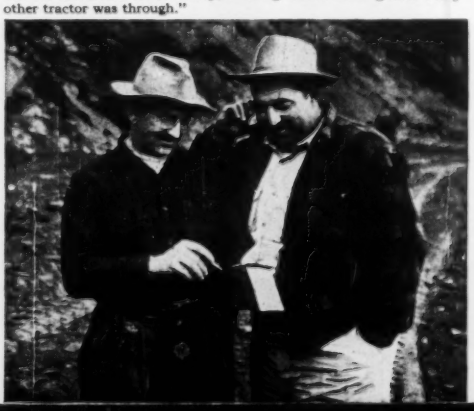
Blazin' Up the Blue Ridge

TD-24s rip up 35,000 yards of rock that otherwise would have needed blasting



PUSHOVER FOR THE CHAMP. The toughest work comes easy for the Big Red TD-24. This great International crawler digs in with 148 maximum *drawbar* horsepower—the most of any crawler on the market.

HAPPY CONTRACTORS Allan Syer and Fred Moore. As Mr. Moore says, "There are two ways to move rock: this way and by blasting. Our TD-24s saved us a lot of money, working rock loose long after every other tractor was through."



It was rough work to build a modern road from Charlotte, N. C., to the cool resorts along the Skyline Drive, atop the famous Blue Ridge Mountains.

One cut and fill followed another—and one cut alone was 110 feet deep in solid rock.

That's where Macon Construction Company dug out 93,000 cubic yards of rock, and instead of blasting it all, they were able to doze and rip out 35,000 yards with two big red International TD-24 crawlers.

"We have rock here that you couldn't touch with a dozer, till the TD-24 came along," says ripper operator Roy Cantrell. *"Now we blade where we couldn't scratch before, and the ripper tears up rock that used to need blasting."*

And dozer operator Jess Leatherwood adds, *"My TD-24 pushes more, moves faster and handles easier than any other tractor—and I've run 'em all!"*

Get complete details on TD-24 capabilities from your International Industrial Distributor . . . and you'll be a TD-24 man yourself from then on in!

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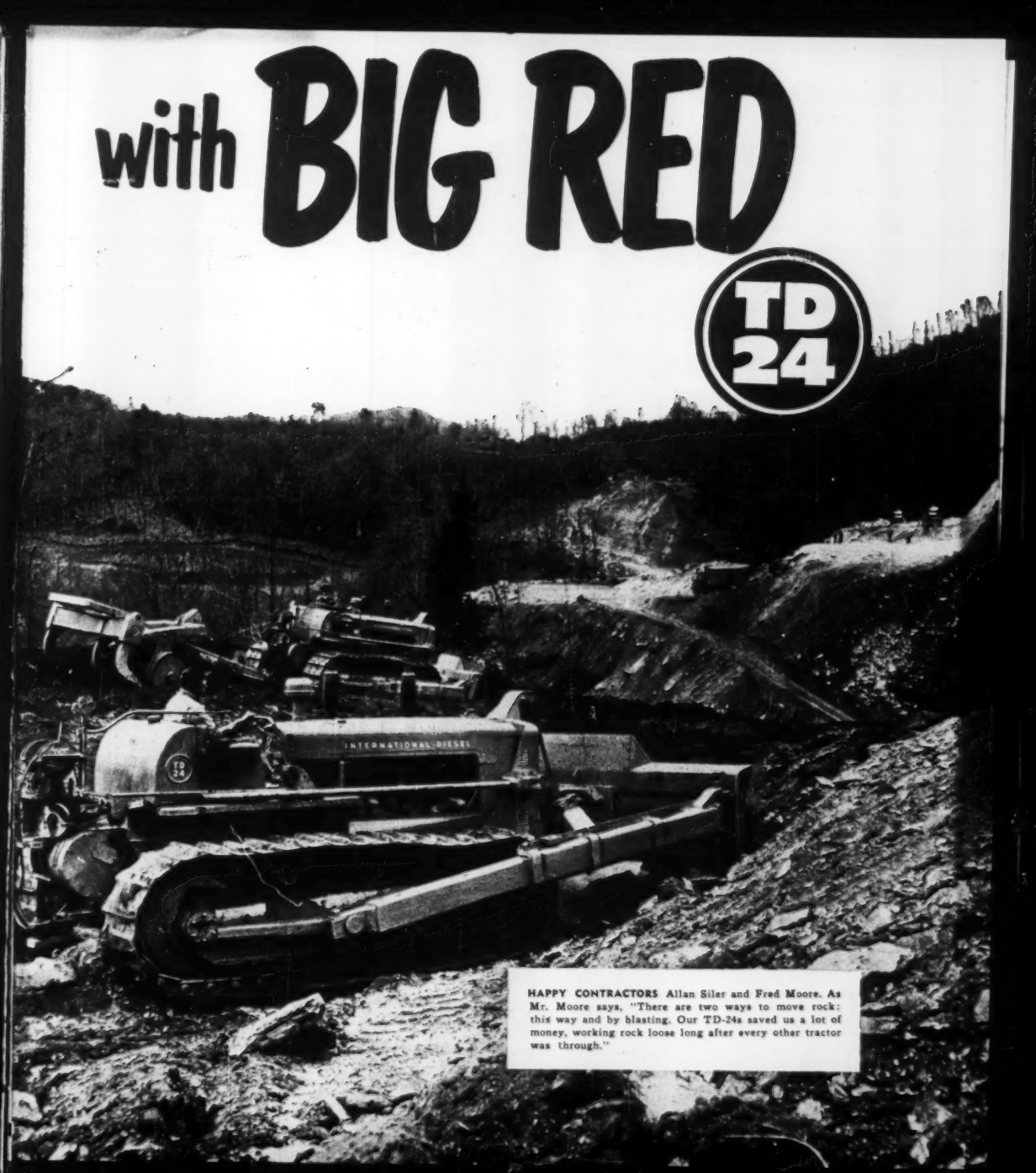

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to move more, faster... use more of your engine's hp.

The formula for moving any load at higher average speeds, *for less,* is simple:

Put your horsepower to work *effectively.*

Every time you lug your engine, or even let it drop below the maximum efficiency range, you lose profits.

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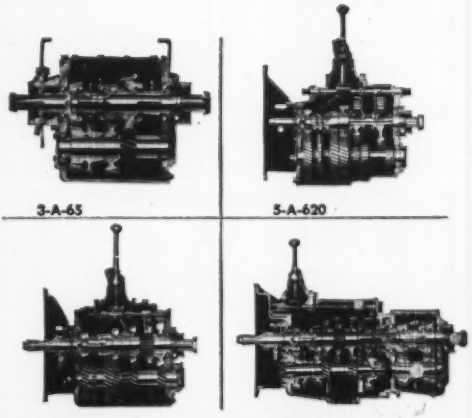
For the transmission is where *horsepower goes to work.* And Fuller has proved, time and again, to owner, to mechanic and to driver that Fuller Transmissions gear your rig to use more of your horsepower—to move more, faster, for less.

Illustrated are four of the wide selection of Fuller Heavy-Duty Transmissions. Ask for data on the type and hp. range in which you are interested.



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ADVERTISERS IN THIS ISSUE

Acker Drill Co. 65
American Trailer Co., Inc. 100
Angelina Hardwood Sales Co. 90
Armco Drainage & Metal Products Inc. ... 18

Baker-Roos, Inc. 96
Bethlehem Steel Co. 40
Blaw Knox Div., Blaw Knox Co. 95
Bruning Co., Inc., Charles 15
Brunson Instrument Co. 86
Buck Equipment Co. 90
Buff & Buff Mfg. Co. 92
Butler Mfg. Co. 99

Casey & Case Foundation Corp. 93
Cast Iron Pipe Research Assoc., Inc. 10, 11
Caterpillar Tractor Co. 16
Ceco Steel Products 51
Celotex Corp., The 6
Cement Gun Company 89
Century Geophysical Corp. 63
Chicago Bridge & Iron Co. .....2nd Cover
Chrysler Corp., Industrial Engine Div. 3
Cleaver Brooks Co. 59
Cole Mfg. Co., R. D. 93
Complete Machinery & Equipment Co. 62
Concrete Surfacing Machinery Co. 92
Continental Motors Corp. 98

Dex Safety Trimmer 60
Du Pont de Nemours & Co., Inc. 87

Euclid Road Machinery 7

Fairbanks-Morse Co. 60
Flexible Road Joint Machine Co. 8
Flint Steel Corp. 107
Franki Foundation Co. 64
Fuller Mfg. Co. 106

Granco Steel Products Co. 33
Grace Mfg. Co., W. E. 55
Great Lakes Carbon Corp. 100
Griffin Wellpoint Corp. 29
Gunite Concrete & Construction Co. 84
Gurley, W. & L. E. 39

Harnischfeger Corp. 97
Hayward Company 86
Heil Company, The 4, 5
Hyatt Bearings Div., G. M. C. 34

International Harvester Co. 104, 105

Jones & Laughlin Steel Corp. 101

Keasbey & Mattison Co. 48

LaPlant-Choate Mfg. Co. 1
Lauson Co., The 57
LeTourneau, Inc., R. G. 9
Leupold & Stevens Instruments, Inc. 2
Lewis & McDowell, Inc. 107

MacArthur Concrete Pile Co. 84
Mahon Co., R. C. 94
Masonite Corp. 58
Mayo Tunnel Equipment Co. 102
McKiernan-Terry Corp. 47
Mesker Steel Corp., George L. 88
Mississippi Glass Co. 89
Morin Mfg. Co. 95

Nat'l. Clay Pipe Mfgrs., Inc. 46
National Surety Corp. 56

Patent Scaffolding Co. 54
Phoenix Bridge Co. 90
Plasteel Products Co. 61
Porter Co., H. K. 86
Posey Iron Works, Inc. 14

Raymond Concrete Pile Co. .....3rd Cover
Robertson Co., H. H. 43
Rust-Oleum Corp. 103

St. Paul Hydraulic Hoist 13
Sauerman Bros., Inc. 62
Servicised Products Company 102
Spencer, White & Prentis, Inc. 65
Sprague & Henwood, Inc. 84
Standard Steel Works 64
Stang Corp., John W. 96
Superior Concrete Accessories 52

Timken Roller Bearing Co. .....4th Cover
Trailer Village, Inc. 92

Universal Form Clamp Co. 20

Wellman Engineering Co. 61
Weyerhaeuser Sales Co. 28
White Co., David 12

Yeomans Brothers Co. 91

Professional Services 67-69

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

Employment
Positions Vacant 69, 70
Selling Opportunities Offered 69
Positions Wanted 70, 71
Employment Services 70

Educational
Schools 71
Tutoring 71

Business Opportunities
Offered 71

Property
For Sale 71

Equipment
(Used or Surplus New)
For Rent 71
For Sale 71-77
Piling 77
Pipe 72
Rail 74
Surveying Instruments 71

Wanted
Equipment 71

ADVERTISERS INDEX 76

ENGINEERING NEWS-RECORD

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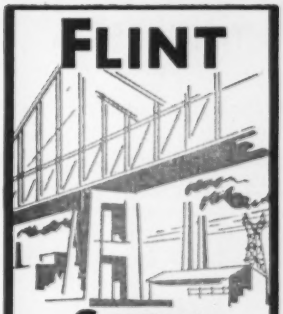

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EDITORIALS

Productivity keeps construction going

CONSTRUCTION LABOR in New York City has set an example of leadership that other labor groups can well follow, in agreeing on the need for increased productivity in order to justify substantial wage raises. In its recent agreement with metropolitan area employers, labor said members will "use their best efforts in the industry's and the public's interest to increase production and reduce costs by maintaining maximum man-hour output and use of all machinery, tools, appliances or methods which may be practical so that the increase in hourly wages herein provided may not result in additional costs to the employers of members of the trade unions."

Particularly in the context of the current strike-torn times, such a statement—freely given by the unions and their members—is a major milestone. It is evidence that within the building industry of New York City, both employers and employees have recognized that theirs is a working partnership—and not a cat-and-dog fight between haves and have-nots.

More, it is recognition of a long-neglected fact: The public which pays the bills for construction or any other service or product cannot and must not be ignored for the sake of momentary advantage during collective bargaining. If the public stops buying construction—nobody wins.

It will pay both construction labor and construction employers everywhere to study this latest agreement, both for some insight on how to make labor relations work, and for the recognition that labor and management are partners—that one side cannot keep on forcing prices up without giving something in return, lest both sides be out of jobs.

Versatility and resourcefulness

SELDOM has so much sound thinking been packed into a short space as is found in Vannevar Bush's comment on the outlook for engineers in the years ahead that is reproduced on p. 49 of the June 19 issue. Especially pertinent is what Dr. Bush said about the relation of engineers to applied scientists and the need for engineers to develop versatility and resourcefulness if they are not to be supplanted by applied scientists in many positions that, theoretically, call for an engineering approach to a particular problem.

There is danger, Dr. Bush said, of a "tendency to turn to engineers only for those things that are so matured that they have begun to appear in handbooks, and to turn to the applied scientist for the novel approach . . . Much of the training of engineers leads to a compartmentalization that contributes directly to this tendency."

How to train engineers to develop the desired versatility and resourcefulness is the problem that Dr. Bush put up to all engineers, not just to the teachers. As a step toward the development of the right type of engineers, employers must give young engineers challenging assignments early in their careers.

Guns-and-butter factories

PROBABLY THE FIRST specifically designed plant to produce both peacetime and wartime goods simultaneously is now being built by General Motors in Arlington, Texas (See p. 53). Over 60% of the total productive floor space is designed as a dual-function area that can be converted back and forth between aircraft and automobile assembly in a matter of only days. The other 40% of floor space is divided into areas permanently assigned to car and plane equipment.

It is significant to compare this "simultaneous" concept of coping with the governmental policy of "guns and butter" with the method of "total" design in which a plant is planned for total production of wartime goods now and for quick and economical conversion to total peacetime production later.

The simultaneous concept has two disadvantages. In the event of all-out production of either product, the permanent facilities belonging to the other cannot be utilized, except for storage, since they contain specialized equipment. Second, the dual function area requires extra space to allow for shifting about and to accommodate two dissimilar products. For example, at the normally designed GM assembly plant at Atlanta, a maximum output of 47 cars per hour can be achieved in less space than 35 cars require in the Arlington plant.

During periods of simultaneous production all facilities are in use. That such periods will be the rule—that the present guns and butter policy is a long-term one—is what GM officials are counting on to make their pioneering venture successful. Then the normal variations in military orders can be handled in the easily convertible dual function area.

A different picture emerges for the total type plants, prime examples of which are the new Ford tank plant near Detroit and Buick's additions to its Flint works, to turn out jet engines and torque converters for tanks. Since there are no dead storage areas, utilization of space approaches that in a normal plant. But if the military product is bigger than the peacetime variety (it usually is), bays often have to be larger than if the plant were designed solely for peacetime output.

The total concept also does not accommodate variations in military orders as economically as does the simultaneous method.

It appears that both concepts will be important considerations in factory design for a number of years to come. They will exert a strong influence in many industries other than the one exemplified above.

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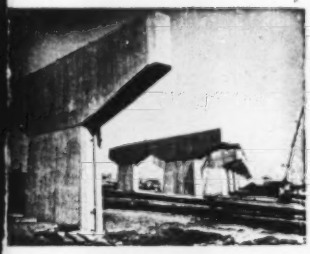

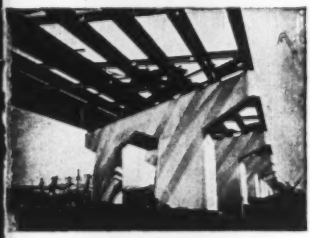

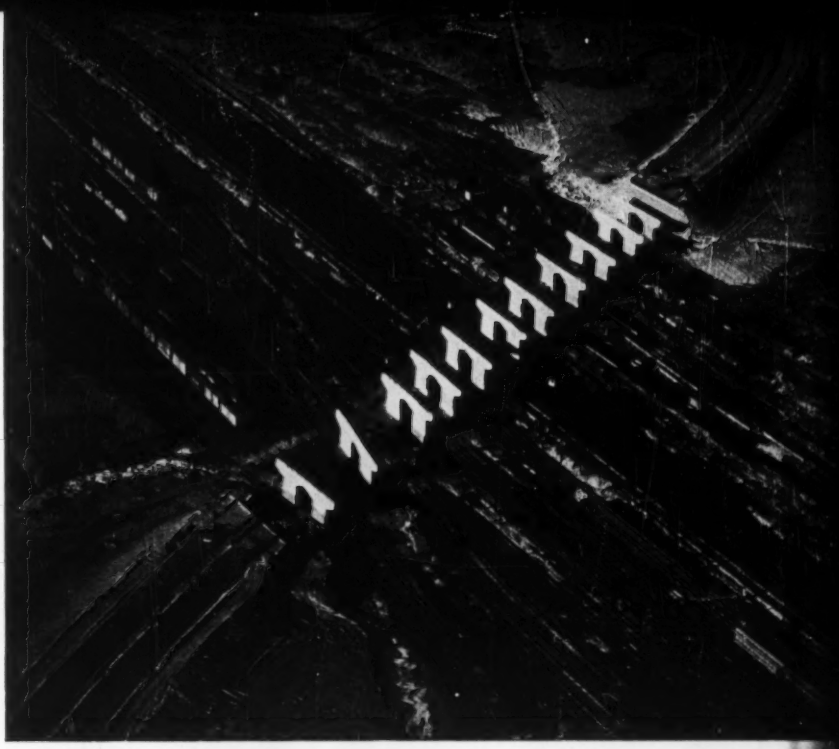

Raymond SALUTES

THE NEW JERSEY TURNPIKE

RAYMOND IS PROUD to have played a vital part in the creation of this fabulous new cross-state highway. The railroad overpass near Ridgefield, N. J., is just one of several projects on the Turnpike that rest on Raymond Piles. 778 Raymond Pipe Step-Taper Piles driven for 11 piers and 2 abutments, with an average length of 120′ and a total footage of 93,283′ were used on this overpass—just another example of the part Raymond is playing in building tomorrow's world today.

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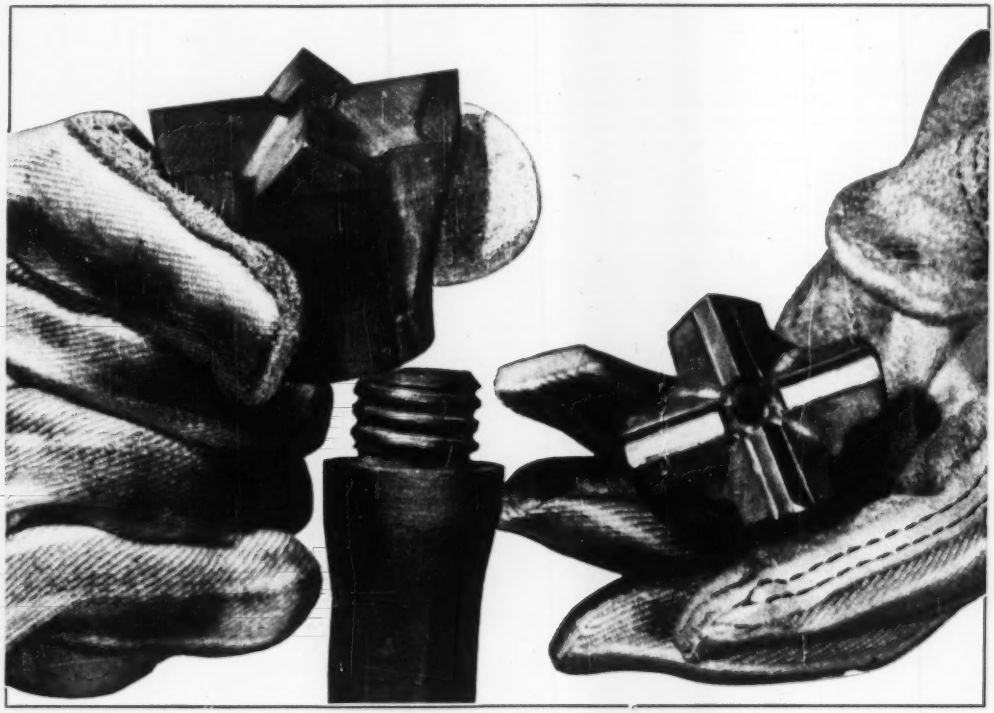

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Use Timken multi-use bits for ordinary ground. With correct and controlled reconditioning, they'll give you the lowest cost per foot of hole when full increments of steel can be drilled.

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Timken carbide insert bits and Timken multi-use bits are interchangeable in each thread series. And both types have these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

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